JPRS 81440

3 August 1982

USSR Report

CHEMISTRY

No. 88

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 81440

3 August 1982

USSR Report

CHEMISTRY

No. 88

FBIS FOREIGN BROADCAST INFORMATION SERVICE

JPRS 81440

3 August 1982

USSR REPORT

CHEMISTRY

No. 88

CONTENTS

UDC 543.51+54.944/945

MASS SPECTROMETRIC METHOD OF ANALYSIS OF TOTAL ACONITUM LEUCOSTOMUM ALKALOIDS

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 1, Jan-Feb 82
(manuscript received 4 May 81) pp 80-86

PLUGAR', V. N., RASHKES, Ya. V., ZHAMIYERASHVILI, M. G., TEL'NOV, V. A., YUNUSOV, M. S. and YUNUSOV, S. Yu., Order of Labor Red Banner Institute of Plant Substance Chemistry, Uzbek Academy of Sciences, Tashkent

[Abstract] A study is made of the possibility of mass spectrometric qualitative and quantitative analysis of complex mixtures of substances separated from vegetable products, on the example of preliminarily-saponified alkaloids from the above-ground portion of Aconitum leucostomum. The object of study is distinguished by the presence of representatives of various groups of alkaloids: diterpene, aporphin and benzyltetrahydroisoquinoline, differing greatly in their mass spectrometric behavior. The sum of alkaloids was complex in nature. In addition to the basic components which were determined chemically, there was a significant number of minor compounds, for which preliminary structural suggestions were made on the basis of measurement of the elemental composition of ions and the spectra. Figures 2; references 9: 4 Russian, 5 Western.
[201-6508]

UDC 547.944/945

STRUCTURE OF DICTYSINE AND DEHYDRODICTYSINE

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 1, Jan-Feb 82
(manuscript received 19 May 81) pp 86-91

SALIMOV, B. T., TASHKHODZHAYEV, B. and YUNUSOV, M. S., Order of Labor Red Banner Institute of Plant Substance Chemistry, Uzbek Academy of Sciences, Tashkent

[Abstract] The alkaloid dictysine $C_{21}H_{33}NO_3$ is extracted from the above-ground portion of Delphinium dictyocarpum DC. Based on mass spectra of dictysine and its trideuteroanalog, NMR spectra and chemical transformations

for the alkaloid, a structure was suggested in an earlier work. However X-ray structural analysis has shown that the compound is based on a denudative skeleton and has a different structure. The geometry of the dictysine molecule is shown in an illustration. The bond lengths and valent angles, as well as conformation parameters of dictysine, agree well with the data found for a related diterpene alkaloid denudatine and its iodomethylate. The base, with mp 143-145°C is easily soluble in chloroform, less easily in methanol and acetone. The alkaloid has an α, β, γ-triol system at C_{15}, C_{16} and C_{20}. The structure of the acetonides of dictysine and dehydrodictysine is determined. Figure 1; references 5: 3 Russian, 2 Western.
[201-6508]

UDC 547.944/945

ALKALOIDS OF BUXUS SEMPERVIRENS

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 1, Jan-Feb 82
(manuscript received 4 Sep 81) pp 125-126

KHODZHAYEV, B. U. and YUNUSOV, S. Yu., Order of Labor Red Banner Institute of Plant Substance Chemistry, Uzbek Academy of Sciences, Tashkent

[Abstract] The authors began the study of the alkaloids of Buxus sempervirens L. collected on 21 May 1978. The content of alkaloids was determined by chloroform extraction: in first year shoots 2.39, in young roots 2.11, in leaves and thin branches 1.64, in blossoms 1.94 and in older branches 1% of the total alkaloids. The ether portion of the alkaloids was dissolved in benzene and separated with reference to basicity over the pH range 8.0-2.2. The combined fractions of total alkaloids for the various pH ranges were chromatographed separately on a column containing aluminum oxide. Alkaloid I was identified with cyclobuxin-D, II with cyclovirobuxin-D, III with cycloprotobuxin-A. References 4: 2 Russian, 2 Western.
[201-6508]

UDC 547.944/945

ALKALOIDS OF NITRARIA SIBIRICA

Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 1, Jan-Feb 82
(manuscript received 26 Oct 81) pp 126-127

OSMANOV, Z., IBRAGIMOV, A. A. and YUNUSOV, S. Yu., Order of Labor Red Banner Institute of Plant Substance Chemistry, Uzbek Academy of Sciences, Tashkent

[Abstract] Continuing the separation of the total alkaloids of the above ground portion of Nitraria sibirica Pall., three additional bases were

isolated. Base I has the composition $C_{15}H_{24}N_2O$, mp 82-84°C (petroleum ether). Base II has the composition $C_{11}H_{10}N_2O_2$, mp 204-205°C. Base III has the composition $C_{10}H_{19}NO$, mp 75-76°C. Characteristics of the IR spectra of the three bases are noted. References 3 (Russian).
[201-6508]

UDC 546.56:54-412.2:543.275.5

INFLUENCE OF COPPER IONS ON INTERACTION OF CERTAIN METALS WITH 2,4-DITHIOBIURET

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82
(manuscript received 24 Sep 80) pp 247-250

SUKHORUCHKINA, A. S. and USATENKO, Yu. I., Dnepropetrovsk Institute of Chemical Technology

[Abstract] The addition of Cu(II) causes the reaction of oxidation-reduction of 2,4-dithiobiuret with palladium, mercury and silver to occur practically instantly, even in weakly acid media. On this basis the authors have developed an amperometric method of determination of vanadium in steels, slags and ferrovanadium using 2,4-dithiobiuret as the titrant. Ampirometric titration of solutions of vanadium (V) in the presence of copper (II) in buffer solutions at pH 2.2-6.0 produces a bell-shaped titration curve, a result of the oxidation of the monovalent copper formed and its subsequent complex formation with 2,4-dithiobiuret. The data produced also confirm the process of production of vanadium (V) by the initially formed monovalent copper. Figures 2; references 4 (Russian).
[197-6508]

UDC 547+541.67

STUDY OF STRUCTURE AND CONFORMATIONAL EQUILIBRIUM OF OXO-, THIO- AND SELENOACYL DERIVATIVES OF PHENYLHYDRAZINE BY NMR METHOD

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82
(manuscript received 28 Apr 79) pp 259-263

CHERVINSKIY, A. Yu., LIPNITSKIY, V. F. and KAPKAN, L. M., Institute of Physical and Organic Chemistry and Carbon Chemistry, Ukrainian Academy of Sciences

[Abstract] A number of diacyl derivatives of phenylhydrazine of the general formula R-CO-NH-N(Ph)-CX-R' were studied, where R, R'=CH_3, Ph, Naph, while X=O, S, or Se. The possibility of recording signals of the individual

conformers by NMR depends on the relationship of their concentrations and the barriers to rotation around the C-N_1 and C-N_2 bonds. Analysis of the PMR spectra of the componds can be used to evaluate the orientation of the N-benzene ring relative to the plane of the $CH_3C(O)N$ group. Since the dimensions of the benzene ring are significantly greater than those of the CH_3 group, the only conformation which is sterically possible for 1-acetyl-benzoylphenylhydrazine is that in which the oxygen atom is rotated toward the benzene ring at the nitrogen atom. Figure 1; references 18: 6 Russian, 12 Western.
[197-6508]

UDC 631.893.13.832.43

KINETICS OF OXIDATION OF NITROSYL CHLORIDE BY NITRIC ACIDS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82 (manuscript received 18 Apr 80) pp 270-273

ATROSHCHENKO, V. I., MOSKOVCHENKO, S. E. and KUTOVOY, V. V., Khar'kov Polytechnical Institute

[Abstract] Waste-free production of potassium nitrate and chlorine from potassium chloride or silvinite is now being developed. The process involves the production of nitrosyl chloride which does not at present have broad application. To utilize the nitrogen and chlorine, nitrosyl chloride must be oxidized to nitrogen dioxide and chlorine, most expediently done by using nitric acid. Laboratory studies of the process were performed on a continuous-flow installation. The degree of oxidation of NOCl, at constant temperature, increases with increase in reaction time, concentration or excess of HNO_3 vapor; with constant time, the degree of oxidation of HNO_3 or excess of it, increases with increase of temperature of the experiment and increase in concentration. A third order kinetic equation is derived to describe the process of homogeneous oxidation of nitrosyl chloride by nitric acid. The data obtained can be used for design of commercial scale processes and equipment. Figures 3; references 7: 1 Russian, 6 Western.
[197-6508]

UDC 574.6

BIOTECHNOLOGY AND ITS PLACE IN SCIENTIFIC AND TECHNICAL PROGRESS

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 4, Apr 82 pp 4-17

OVCHINNIKOV, Yu. A., academician

[Abstract] A brief history of biology since the time of Darwin is presented in this transcript of a report presented at a general meeting of the USSR Academy of Sciences. This is followed by a definition of biotechnology as the use of biological processes and agents for industrial purposes. Biotechnology also includes the use of biological sources of energy, the so-called renewable energy resources including various representatives of the plant kingdom, constantly accumulating the energy of the sun. The problem of photosynthesis in all its variety is included. Biotechnology is also of decisive significance in the struggle against environmental pollution, since microbiological methods can be effectively used to destroy and process both industrial and domestic wastes. The most promising area of biotechnology is genetic engineering, the primary goal of which is the production of human, plant or animal genes for use in such areas as medicine. Genetic engineering has already yielded an effective means of producing insulin, and is being used in the attempt to produce interferon. A diagram of cloning of human interferon genes is presented. Recently the Institute of Molecular Biology, USSR Academy of Sciences, achieved the production of somatotropin, human growth hormone. Another important area of genetic engineering is cell engineering, particularly important for immunology. A diagram of the production of monoclonal antibodies is presented. The prospects for biotechnology are tremendous. It represents a new stage in the synthesis of modern biological knowledge and technological experience. Figures 9.
[199-6508]

UDC 665.654

HYDRODEMETHYLATION OF TOLUENE ON NICKEL-ZEOLITE CATALYSTS OBTAINED THROUGH NICKELOCENE

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82 (manuscript received 26 May 80) pp 263-266

GOLUBCHENKO, I. T., KOZHEVNIKOVA, N. L. and MOTORNYY, V. G., Institute of Physical-Organic Chemistry and Carbon Chemistry, Ukrainian Academy of Sciences, Petrochemistry Section

[Abstract] This work presents results of a study of the reaction of hydrodemethylation of toluene (to form benzene) in the presence of nickel catalysts prepared using nonaqueous solutions of a complex organic compound, biscyclopentadienyl nickel (nickelocene). Nickel-zeolite catalysts containing the lithium, sodium, potassium, rubidium, cesium and barium cations have identical activity and selectivity. Transformation reaches 67-68% with a selectivity of the process of 69.3-71.3% as benzene. The difference in catalytic activity of nickel-zeolite catalysts with alkali metal and barium cations on the one hand and nickel-lanthanum-containing and nickel decationated specimens, on the other hand, can be explained by the varying degree of reduction of nickelous oxide formed upon passivation of the nickel following decomposition of the nickelocene adsorbed by the zeolite in the process of producing a catalyst. On zeolite containing 3% nickel, as well as alkali metal and barium cations, the yield of benzene is 47-48%. Figure 1; references 11: 9 Russian, 2 Western.
[197-6508]

UDC 542.943:665.725.4-125

LIQUID PHASE OXIDATION OF ISOBUTANE

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82 (manuscript received 7 Apr 80) pp 266-270

FEDURISA, M. U. and ABADZHEV, S. S.

[Abstract] A comparative study is presented of the noncatalyzed and catalyzed (by salts of metals of variable valence) oxidation of isobutane in an acetic

acid solution on a laboratory installation, a bubbler-type vessel made of stainless steel with a capacity of 1 liter placed in a thermostat containing glycerin. Oxidation was performed under a pressure of 50 atm at 150-180°C, air flow 1 ℓ/min or 40 ℓ/100 g isobutane per hour. The presence of manganese causes a change in the distribution of reaction products. As manganese concentration increases, the selectivity of formation of acetone greatly decreases, the selectivity of formation of formic acid increases. The manganese interacts with the hydroperoxide and apparently converts it to molecular products, thus decreasing the rate of the chain branching reaction and leading to a decrease in the degree of conversion of the initial hydrocarbon and the rate of acetone formation. Figures 3; references 10: 6 Russian, 4 Western.
[197-6508]

UDC 541.128+539.217.1+539.217.5+533.15

INFLUENCE OF PORE STRUCTURE ON CATALYTIC PROPERTIES AND MECHANICAL STRENGTH OF MODIFIED VANADIUM-MOLYBDENUM OXIDE CATALYSTS

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82 (manuscript received 5 Sep 80) pp 273-276

YAKUBOVICH, M. N., SIMONTSEV, V. I., VYTNOV, G. F., LUYKSAAR, L. S., LAZAREVA, N. A. and KHOLYAVENKO, K. M., Institute of Physical Chemistry imeni L. V. Pisarzhevskiy, Ukrainian Academy of Sciences

[Abstract] A study is made of the influence of press pressure on the pore structure of modified vanadium-molybdenum oxide catalysts and the variation between pore structure and catalytic properties, as well as the mechanical strength of the catalyst in question. An increase in pressing pressure results in a reduction in pore size. Catalytic properties of a vanadium-molybdenum system (in oxidation of acrolein to acrylic acid) were studied at 230-320°C. Maximum catalytic activity was observed at 270°C. Reduced porosity causes increased concentration of destructive oxidation products in the reaction products and a decrease in the overall acrolein oxidation rate. High pressure thus provides satisfactory strength but unsatisfactory catalytic properties. It is recommended that catalysts grains be formed in the moist state without pressure, by tableting with a filler, or other methods. Figures 2; references 4: 3 Russian, 1 Western.
[197-6508]

DEVELOPMENT AND INTRODUCTION OF NEW CATALYSTS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 2-4

MANETOV, A. G.

[Abstract] In recent years, scientific research and planning institutes as well as industrial enterprises have performed significant work in the area of synthesis of new and improvement of existing industrial catalysts. Industrial production of zeolite-containing catalysts with rare earth elements has made a significant contribution to catalytic cracking. The development of new catalytic cracking catalysts containing new types of zeolite with low aluminum content, capable of selectively cracking normal and moderately branched paraffin hydrocarbons, has been very important. Series KR bimetallic and polymetallic catalysts have been introduced, with slower deactivation rate than monometallic catalysts, improving catalytic reforming. Improvements in granulation of reforming catalysts are still needed, however, which would reduce grain size from 4-6 mm to 1.4-1.6 mm.
[200-6508]

UDC 665.64.097.3.002.2

CATALYST PRODUCTION AT RYAZAN' OIL REFINERY

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 7-8

KNYAZEV, V. M. and FILATOVE, L. T., Ryazan' Oil Refinery

[Abstract] The technology of production of aluminocobalt molybdenum catalyst at this plant is described. Aluminonickel molybdenum and aluminonickel molybdenum silicate catalysts are also produced. An experimental plant for production of spherical active aluminum oxide ("sferal'") has been installed and put on stream. The new technology requires no drying drum and produces stronger granules. Future development of catalyst production is to be realized by reconstruction of existing facilities rather than construction of new facilities. The technology of aluminoplatinum and palladium catalysts will be significantly changed, replacing the exhaust gas heat-transfer agent with heated air.
[200-6508]

UDC 665.64.097.3.002.2

DEVELOPMENT OF CATALYST PRODUCTION FACILITIES AT UFA OIL REFINERY

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 p 6

PROKOPYUK, S. G., ROZENBAUM, B. L., PUTILIN, N. Ye., AMIRKHANOV, K. Sh., MOROZOV, B. F. and BRITENKOVA, T. G., Ufa Refinery

[Abstract] The Ufa Order of Lenin Oil Refinery is one of the USSR's largest facilities for production of catalysts for oil refining and petrochemistry, as well as for the food industry. Nine types of catalysts are produced for cracking, selective hydrogenation and oligomerization. A plant for production of NaY zeolite catalysts by the ash method has been remodeled. The production of nickel catalysts on kieselgur is growing rapidly. The facility for producing copper-chromium type MKhB catalyst is to be remodeled during the 11th Five-Year Plan. Production of cracking catalysts will be basically redesigned, increasing the capacity by 50% and significantly improving the operating characteristics of microspherical catalysts.
[200-6508]

UDC 665.64.097.3.002.2

CREATION OF SPECIALIZED PLANT FOR CATALYST PRODUCTION

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 p 5

MAKAR'YEV, S. V., KRUGLOVA, T. F. and KACHURA, V. V., Grozgipronefteknim Institute [State Petrochemical Design Institute, Groznyy?]

[Abstract] The authors' institute has been the initiator in the creation of a specialized plant for the production of catalysts and adsorbents for oil refining and petrochemistry. The new specialized plant will feature combined raw material and finished product storage areas, utilized by several plant sections. The plant will produce microspherical zeolite-containing type RSG-6ts cracking catalysts and a phosphoric acid catalyst on a silica gel carrier. Streams of waste fluids will be evaporated to produce solids and pure water. Automation and mechanization of production with elimination of heavy manual labor has been a primary goal.
[200-6508]

UDC 665.64.097.3.002.2

PRODUCTION OF POLYMETALLIC REFORMING CATALYST

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 8-10

ZHARKOV, B. B. and KLIMENKO, T. M., "Lenneftekhim" Scientific-Production Association

[Abstract] Studies at the All-Union Scientific Research Institute of Petrochemistry on the improvement of catalytic systems and the search for new compositions, plus experimental work performed at production facilities, have resulted in a number of modifications to type KR catalysts, which have many advantages over type AP catalysts. The laboratory studies have resulted in a redesign of the heating unit, assuring uniform movement of the catalyst and distribution of air flow through the apparatus, significantly improving the quality of catalysts produced. The new catalysts are promising for the process of reforming under pressures of 0.8-1 MPa. References 5 (Russian). [200-6508]

UDC 665.658.2

NEW CATALYSTS FOR HYDROREFINING OF HEAVY DISTILLATES

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 13-14

CHAGOVETS, A. N., OSIPOV, L. N., LEBEDEVE, B. L., PEREZHIGINA, I. Ya. and AGAFONOV, A. V., All-Union Scientific Research Institute of Oil Refining

[Abstract] In recent years, the authors' institute has developed and synthesized new hydrorefining catalysts more active than the aluminocobalt molybdenum and aluminocobalt molybdenum silicate catalysts previously used. A series of catalysts, type GO, containing up to 21% molybdenum oxide, has been developed at the institute. Cobalt oxide or nickel oxide, applied to active aluminum oxide, is used as a second hydrogenating component. The activity of these catalysts was tested in hydrodesulfuration of 350-500°C vacuum distillate from crude oil containing 2.0 mass % sulfur, 0.1 mass % nitrogen. The depth of desulfuration of the vacuum distillates on GO-116 catalyst was 7.5-15% higher than on aluminocobalt molybdenum catalyst. Reaction rate constants were also approximately double. Long term testing was undertaken to prove the stability of GO-116 catalysts, and it was found to be satisfactory for 3200 hours of operation. References 4 (Russian). [200-6508]

PRACTICAL USES FOR COMPLEXONS

Kishinev SOVETSKAYA MOLDAVIYA in Russian 16 Apr 82 p 4

[Article by SOVETSKAYA MOLDAVIVA correspondent A. Rozhnov, Moscow: "Complexons--Our New Allies"]

[Text] New chemical compounds, called complexons, are finding a wide range of applications throughout the nation economy.

An unfortunate situation arose in one of the regions of the Ukrainian SSR. Vineyards were stricken with chlorosis, a serious disease caused by inadequate iron supply to the plant. Without iron, chlorophyll cannot be formed, and photosynthesis cannot take place. As a result, the plant eventually dies. These Ukrainian vineyards, however, lie in lime soil that is rich in iron. So what can be the explanation for the disease? The lime changed the iron into a form unusable by the plants by converting it into insoluble salts. A trusty "doctor," the "water of life", has come to the aid of the grape growers.

A helicopter appeared over the grape plantations and sprayed the vineyards with this "water of life". After a short time, it seemed that the incredible had happened: in the midst of the mass of yellowing plants, small islands of green began to appear. Soon the entire vineyard had become green and healthy.

On the Ukrainian sovkhoz "Podgornoye", 25-30 year old high-yield pear trees were stricken with what turned out to be the same type of chlorosis. Here, again, the "water of life" came to help and the harvest from the pear trees that same year was quite good.

Just what exactly is this "water of life"? We asked Nina Mikhaylovna Dyatlova, department head, Scientific Research Institute of Chemical Reagents and Ultrapure Chemical Substances, doctor of chemical sciences, professor and USSR State Prize laureate.

She explained that the "water of life" contains complexons, complicated substances with precise chemical formulas. The molecules of these substances can be imagined as crab-like structures that are able to capture metallic

cations with their pinchers. They draw the metal's positively charged ions toward them and hold the ions in a tight "death grip". As a result, compounds are formed which are strong, and, at the same time readily soluble in water.

From the start, the complexons caused a revolution in analytical chamistry. Instead of several hours, it took specialists only 2-3 minutes to determine the presence and quantity of practically all metals in a solution. The primary benefit however, is that the complexons have turned out to be a reliable and virtually invaluable aid for workers in diverse industries throughout the national economy, and what aids they are!

Specialists in the power industry were the first to appreciate the amazing properties of this new power engineer. They used complexons as a good medical orderly in their fight against their age-old enemy, boiler scale, that is constantly being formed on pipes and walls of boiler plant assemblies during operation of heat and hydroelectric stations. Thus, complexons, replacing the previous system of flushing and cleaning, cut the time from 5 days to one day that the energy equipment had to lie idle and significantly increased the time between cleanings. This is of considerable importance, since a 24-hour shutdown of just one power station with a 300 megawatt capacity costs the government 20,000 rubles.

What process occurs in "curing" the plants of chlorosis? The complexon molecules reach the plant leaves along with an ion of iron and then, due to the action of the sun's ultraviolet rays, decompose, thus releasing the "captive" iron ion. It is important that here the "water of life" not only cures the plants, but actually is the means for delivering iron to them. Applied as a fertilizer, the "water of life" helps the plant interact with the lime water iron that was previously insoluble. This will lead to a significantly larger harvest. The effect of complexons has been confirmed in a number of regions throughout the country. With the help of these substances, plants can receive not only supplemental iron, but also copper, boron, molybdenum, and nickel. The required doses are literally miniscule, and the results are considerable. Expenditure of complexons is small; for example, one hectare of planted crops would need approximately 2.5 kilograms of the material. The new substance is inexpensive since it is made from chemical industrial waste.

Complexons have proven to be an invaluable aid in wine making as well. Staff personnel from N. M. Dyatlova's division succeeded in significantly prolonging the life of grape wines and brandies. At Moscow and Mogilev plants alone, where the use of complexons has been introduced into the wine making process, the economic effect has been estimated at 200,000 rubles per year.

The economic benefit from implementing this new development on farms in the Ukraine alone, where work with complexons is quite active, is set at 11 million rubles per year.

There are benefits from using the complexons that cannot be translated into monetary terms, namely, the health of human beings. In the tanning industry, for example, complexons can replace hydrochloric acid. Suffice it to say, the use of complexons also allows tannery workers to combine two operations into one: skin preserving and tanning processes can be done at the same time.

Complexons with specified properties are already having practical results in other industries in the national economy.

Nina Mikhaylovna showed me a letter from M. Pashaly, Chairman of the Chadyr-Lunda Rayon Soviet of Kolkhozes. He asked the developers of the complexons to help him obtain 2-3 quintals of the new material for use in southern Moldavia. The division receives many letters like this. Clearly the time has come to consider more effective measures for introducing the use of complexons into the economy. They are truly an invaluable contribution to the agriculture of the republic.

How can this problem be solved? We can draw on the experience of Kazakhstan and Tajikistan. In Alma-Ata and Dushanbe, staff personnel of N. M. Dyatlova's division have conducted scientific sessions in the field, have given lectures, and made concrete recommendations. Now, in those republics, complexons are already being put into wide use.

9967
CSO: 1841/194

TOMSK PETROCHEMICAL PLANT IS ON STREAM

Moscow IZVESTIYA in Russian 21 Apr 82 p 3

[Article by special IZVESTIYA correspondent L. Levitskiy: "Tomsk Petrochemical Plant Is On Stream"

> [Text] A state commission issued a certification report approving operation of the foremost combine in the petrochemical industry: a factory with production capacity of 100,000 tons of polypropylene per year.

This is the largest installation of its type in the world. It will produce 2.5 times more polypropylene than all existing enterprises of the industrial branch put together. Of course, some time will be required to fully develop the plant, but the Tomsk petrochemical workers will soon be delivering no less than 45,000 tons of valuable polymer materials. There is no doubt about this because the state commission certificate was signed only after thorough safety tests and rather protracted, steady operation of the plant had been completed. All of the equipment was tested at peak modes and it met the calculated projected capacity.

Following the certification initiating plant operation, the reliable automatic production lines were set into motion and 15,000 tons of polypropylene entered the national economy. The high quality of production is confirmed by many consumers throughout the country. The Siberian polymers have also appeared on the international market.

"We are now fulfilling an order from the Balakovo 'Khimvolokno' Association," said R. Akchurin, polymerization shop technologist. "Our customers needs are varied. Polymers are used, after all, in producing consumer goods, machine building, and agriculture. I should add that one ton of chemical fibers can replace 2.5 tons of cotton or wool, which saves 10,000 rubles."

The Tomsk personnel are the first in the industrial branch to begin producing composition polymers. It is possible to construct material with previously-specified characteristics. Thus, a telegram came from Kirov city. A factory that manufactures the popular "Vyatka" washing machine asks for a polypropylene that would be resistant to high temperatures and alkaline fluids. Granules filled with asbestos will have these characteristics. There is a large demand for copolymers. They are more durable and resist low temperatures. The Tomsk plant has produced a successful test batch of this kind of material.

The stability of the petrochemical plant's operation lies in the reliability of its overall administration. There are high-capacity nitrogen and hydrogen stations in operation, a boiler plant, a closed water supply system, and purification facilities. Housing units are under construction, as well as buildings designated for public and daily living purposes.

"The Tomsk combine will play an integral role in the industry," said F. Vlaskin, deputy minister of the USSR Chemical Industry. "By the end of the current five-year plan, it will reach a production capacity of 600,000 tons of plastic materials per year. The Tomsk plant will contribute a fourth of the increase in plastics production of the entire country. Comrade L. I. Brezhnev named the Tomsk combine as one of the enterprises forming the nucleus of the modern petrochemical industry."

Each year a large new factory is supposed to be added to the combine. In light of this plan, the Tomsk workers' ability to rapidly initiate and master the most complex production processes is especially valuable.

9967
CSO: 1841/194

BRIEFS

NEW CHEMICAL PLANTS OPEN--The largest shop in the polyethylene-polyamide industry has begun operation at the "Khlorvinil" Association in Kalush. Yesterday marked its first day of production. Almost 30,000 tons of effective chemical protectants for plants will be manufactured from raw materials here. Specialists from the Sterlitamak "Kaustik" Association are helping to familiarize the collective with operation of the complex new equipment. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 1] A new complex is starting operation at the "Organicheskiy Sintez" Association in Sumgait. Its projected production capacity is 50,000 tons per year. It will produce caustic potash, a raw material for fertilizer manufacturing and other products. In the present five-year plan, this chemical plant, the largest in the republic, will contribute significantly to realizing the goals of the food production program. The volume of production is set to increase by one third. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA 25 Apr 82 p 1] 9967

EXPERIMENTAL POLLUTION CONTROL DEVICES--Sound may be used eventually for protecting the environment. Research has shown that the energy of sound waves significantly improves the process of combustion. As a result, the amount of harmful particles and soot released into the air by power stations can be decreased. This principle is being used in the construction of a new apparatus for burning natural gas and heavy oil. The device was designed by engineers at the "Teploproyekt" Institute, and is called an "acoustic burner". It can be used in the furnaces of the machine building and metallurgical industries, and anywhere, in fact, that waste products of combustion pose a threat to man or the environment. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 2] The problem of trapping nitrogenous oxides, a toxic industrial waste, has given rise to more than 20 different methods of purifying smoke gases. Uzbek scientists have done their part in curbing the "foxtail", as this smoke is called because of its bright orange color. They designed and installed an experimental industrial device with a thermal reduction system. In it, the mixture of air and nitrogenous oxides "burn up" together with natural gas in a special furnace chamber. The high temperature causes a chemical reaction which results in the formation of carbonic acid gas, water and nitrogen. These substances can then be used in fertilizer production. The heat from the gases is not lost either: it can be used in a steam boiler and in drying plants. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 2] 9967

9967
CSO: 1841/194

IMPROVEMENT OF PLANNING AND MANAGEMENT, THE MOST IMPORTANT CONDITION OF INCREASING PRODUCTION EFFICIENCY AND WORK QUALITY

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 82 pp 2-5

KARPENKO, L. P., member of Board, USSR Ministry of the Petrochemical Industry

[Abstract] This editorial discusses the need for a sharp increase of production efficiency and work quality and universal intensification of production to comply with the decisions of the 25th and 26th CPSU Congresses. The achievements of the 10th Five-Year Plan are reviewed. An increase of production by 22.2%, an increase of profits by 35.1%, an increase of labor productivity by 20.1% and an increase of the fraction of products with higher category of quality up to 42% of the total production volume are planned according to the basic directions for economic and social development of the USSR for 1981-1985 and for the period up to 1990. An increase of production volume by 103.3% was reported in 1981 compared to 1980, including approximately 80% due to an increase of labor productivity. The output of petrochemical products required by the chemical and microbiological industry increased 1.5-fold for liquid paraffin, 1.3-fold for butyl alcohol and increased by 11% for ethylene and propylene. The second year of the five-year plan in 1982 should see an increase of production volume by 3.3%, labor productivity by 2.8% and profits by 6%.
[150-6521]

UDC 661.321.22:66.012.3

HEAT ENERGY SYSTEM FOR SODA MANUFACTURING

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 3, Mar 82 pp 157-158

SHAKHOVA, A. F., TKACH, G. A., GUBENKO, Yu. P. and KUSHNIR, G. B.

[Abstract] An overall energy flow is designed, taking into account three types of inputs: electric energy, used for pumps and other machinery; mineral fuel, used mainly to roast the limestone for CO_2 generation; and steam, the principle mechanism for energy transfer and loss. The losses in electrical and mineral energy are small and difficult to recover; hence only steam losses are significant. Steam calcining and distillation account

for 44.1% and 39.1% of the fugitive energy, respectively. Of the total amount of steam lost, 37.7% has a pressure of 1.2 MPa and a temperature of 380°C; the remainder has a pressure of 3.6 MPa and a temperature of 400°C. All of the spent steam from the CO_2 compressor turbines and vacuum pumps together with about 30% of that from the distillation procedures can be recycled. Savings due to the implementation of these conservation measures is on the order of 400,000 rubles per year. Figure 1; references 5: 4 Russian, 1 Western.
[193-12027]

UDC 661.426.2

PREPARATION OF NaCl FROM SPENT WATER OF CHELEKEN CHEMICAL PLANT

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 3, Mar 83 pp 160-161

SHENKER, M. A. and BLAGOVESHCHENSKAYA, Ye. A.

[Abstract] Table salt is obtained by natural evaporation of spent waters, from the title plant, in artificial basins at the plant site. In order to obtain a greater recovery of purer salt from underground, high-NaCl content water there, a laboratory study on the isothermal evaporation of the salt solution was carried out. The composition of the liquid and solid (precipitated) phases were monitored as a function of the amount of water removed. The less abundant components were concentrated in the mother liquor and their ratios remained constant throughout the precipitation of NaCl. This indicates that none of the minor components was removed into the solid phase over the density range 1.152 g/cc (unsaturated with respect to NaCl) to 1.378 g/cc. The quality of the crystallization product did not deteriorate over the range of 29.5% to 75% recovery. Foreign ions accounted for less than 0.72% of the precipitated salt and did not change over the above recovery range. After the initial removal of NaCl, some of the remaining microelements, such as the borates, may be economically recovered. The favorable climate permits this salt basin method to be used for the Cheleken plant. References 5 (Russian).
[193-12027]

KUYBYSHEV CHEMICAL DEVELOPMENTS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 83 pp 3-4

PROKOPOVICH, V. I., president, Kuybyshev Oblast Trade Union Committee of Workers in Chemical and Petrochemical Industries

[Abstract] Results of plan fulfillment by production associations producing nitrogen and phosphorus mineral fertilizers in the Kuybyshev oblast are reported. The "Togliatti Nitrogen" plant has become the largest Soviet

producer of liquid ammonia. A major new undertaking involves a liquid ammonia pipeline system connecting Togliatti and Odessa, constructed underground and controlled by computer. This ammonia pipeline has been added to the Gorlovka-Odessa line completed in 1979. The fulfillment of production plans in several areas is hampered by domestic and social problems that remain unsolved. As a result, personnel turnover amounts to 43%, for example, at the "Transammiak" ammonia transportation association. Plans for plan fulfillment and production of living amenities are cited.
[212-12131]

UDC 536.46

HEAT ABSORBING PROPERTIES OF EXPLOSION DAMPING POWDERS

Leningrad ZHURNAL PRIKLADNOY KHIMII in Russian Vol 55, No 3, Mar 82
(manuscript received 29 Oct 79) pp 595-598

DATSENKO, D. F., ZABUGA, V. Ya., DOLINSKAYA, L. P., SHEVTSOV, N. R., MIKHAYLOV, A. B. and LUBYANYY, V. Ye., Kiev State University imeni T. G. Shevchenko

[Abstract] Thermochemical calculation is performed of the heat absorbing properties of a number of compounds as the compounds are heated from room temperature to 1000 K. This temperature interval was selected largely arbitrarily, its upper limit being close to the ignition temperature of a stochiometric mixture of methane and air. The ignition temperature may be significantly higher when an inhibiting powder is present, its value depending on the chemical nature and concentration of the powder. The critical temperature of thermal ignition may also be higher. The results of the study indicate that the explosion damping effectiveness of powders is unambiguously determined by their heat absorbing capacity. The kinetics of decomposition of the salt of which the powder is made and its inhibiting properties for methane-air mixtures should also be considered. Figure 1; references 9 (Russian).
[190-6508]

UDC 541.126+536.48

IGNITION OF CONDENSED SYSTEMS FOR VARIABLE HEAT FLOW

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 56, No 3, Mar 82
(manuscript received 19 Feb 81) pp 596-600

LYUBCHENKO, I. S., MATVEYEV, V. V. and MARCHENKO, G. N.

[Abstract] An asymptotic method is presented for calculating the basic characteristics for igniting condensed materials under a variable heat flow. Equations for minimum time and minimum energy required for ignition

are derived in terms of various temperatures together with physical, kinetic and thermodynamic properties. The final equation has the form

$$q(t) = 4.19 \times 10^4 \sum_{k=0}^{5} b_k t^{k+0.5}, \ W/m^2$$

where q(t) is the variable heat flow, t is the time in seconds and b_k is a constant for each of the six values of k (0 to 5 inclusive). Values for the ignition time determined by the asymptotic, by an iterative and by an experimental method are in good agreement: 0.0335, 0.032 and 0.034 seconds respectively. Figures 6; references 10 (Russian).
[188-12027]

UDC 536.48+541.126

HETEROGENEOUS IGNITION OF CONDENSED MATERIALS

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 56, No 3, Mar 82
(manuscript received 19 Feb 81) pp 601-605

LYUBCHENKO, I. S., MATVEYEV, V. V. and MARCHENKO, G. N.

[Abstract] The basic description of a stationary regime for a heterogeneous system differs from those currently available in that the calculations accounting for the heat liberated by the chemical reaction are incorporated into the boundary conditions for the surface of the material rather than into the equations themselves. Equations are developed in this article for minimum time and minimum energy of ignition for both convective and conductive heat exchange. The valves obtained by this method differ by less than 5% from those obtained by a numerical integration technique. Ignition of nitrocellulose is used as an example. Figures 6; references 6: 4 Russian, 2 Western.
[188-12027]

UDC 541.182.45:614.841.12

EFFECT OF FOAM STRUCTURE ON FLAMMABILITY OF FILLER GAS

Moscow KOLLOIDNYY ZHURNAL in Russian Vol 44, No 2, Mar-Apr 82
(manuscript received 1 Apr 81) pp 384-386

TSAP, V. N., SHAROVARNIKOV, A. F., KOROL'CHENKO, A. Ya., IVANOV, A. V. and BOBKOV, A. S., Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov; All-Union Scientific Research Institute for Fire Protection, Moscow

[Abstract] This is a study of the effect of structure of fire-repressing forms on concentration limits of flammability as distributed in inflammable gas-air mixtures contained in the foam globules using a multi-stage experimental

apparatus. The foam was formed using secondary sodium alkylsulfates alone and with additions of higher aliphatic alcohols with a long C_{12}-C_{16} carbon chain. A series of tests was conducted to determine flash points and extinguishing points for the various foams, using propane, isobutane, ethylene and ethylene oxide. Results showed that the foam with added higher aliphatic alcohols was twice as effective as a fire repressant. This is apparently related to the higher degree of moisture vapor that is emitted by the foam coating. The lower diffusion permeability hampers convective heat transfer from the flame front to the interior of the mixture. Figures 4; references 7: 6 Russian, 1 English.
[210-12131]

UDC 541.124.13

MECHANISM AND KINETICS OF SPONTANEOUS IGNITION OF METHANE

Moscow KHIMICHESKAYA FIZIKA in Russian No 4, Apr 82 (manuscript received 5 Jan 82) pp 536-543

BORISOV, A. A., DRAGALOVA, Ye. V., ZAMANSKIY, V. M., LISYANSKIY, V. V., SKACHKOV, G. I. and KOSTEA, K., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] This work compares various experimental values of the ignition delay τ during high temperature oxidation of CH_4, determines the most important elementary stages occurring in the period of induction of the process and produces analytic expressions for practical calculation of methane ignition delay over a broad range of initial conditions. Experimental values of τ are produced in the interval of 890 to 1920 K, the mechanism of the process is analyzed and the problem of the cause of differences in observed variations of τ as a function of CH_4 and O_2 concentration and temperature is studied. Figures 2; references 50: 9 Russian, 41 Western.
[195-6508]

UDC 631.378.335

INVERSE POPULATION OF ELECTRON OSCILLATING LEVELS OF MOLECULES UPON ADIABATIC EXPLOSION OF EXOTHERMIC MIXTURE

Moscow KHIMICHESKAYA FIZIKA in Russian No 4, Apr 82 (manuscript received 2 Nov 81) pp 544-552

KOCHELAP, V. A. and MEL'NIKOV, L. Yu., Institute of Semiconductors, Ukrainian Academy of Sciences, Kiev

[Abstract] A theoretical study is presented of various kinetic conditions of adiabatic explosion. The values of initial parameters for which non-equilibrium concentrations of atoms and radicals are at their maximum are

determined, and conditions of development of an inverse population of electron oscillating levels of recombination product molecules are determined. The two specific mixtures studied, pure ozone and ozone with carbon monoxide, illustrate the possibility of achieving inversion for phototransitions with radiation throughout the entire visible band. Figures 2; references 17: 10 Russian, 4 Western.
[195-6508]

UDC 541.124+536.46

MECHANISM OF OXIDATION OF COAL BY NITRATES DURING COMBUSTION

Moscow KHIMICHESKAYA FIZIKA in Russian No 4, Apr 82 (manuscript received 4 Aug 81) pp 553-556

GLAZKOVA, A. P. and KAZAROVA, Yu. A., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] A study is made of the combustion and thermal expansion of stoichiometric mixtures of coal with various metal nitrates, acting simultaneously as oxidizer and catalyst. These mixtures can be considered a simple model of heterogeneous oxidation of carbon by oxides of nitrogen formed in the process of decomposition of nitrates. Binary stoichiometric mixtures of the nitrates of alkali, alkaline earth and other metals with coal were used with particle sizes $<100\ \mu m$. The experiments were performed in a constant pressure bomb at 100 atm with the specimens either pressed in plexiglass tubes, with inside diameter 0.007 m, to near theoretical density or poured into glass tubes. The mixtures with alkali metal nitrates burned 5 to 9 times more rapidly than the mixtures with alkaline earth nitrates. Binary mixtures with calcium nitrate tetrahydrate did not burn right up to 1000 atm. If the water of crystallization is removed, combustion begins at a pressure of about 25 atm. The reaction sequence, involving production of CO and NO, then CO_2 and N_2, is presented. Figures 3; references 13: 7 Russian, 6 Western.
[195-6508]

UDC 614.841.12:547.31

PREDICTION OF CONCENTRATION LIMITS OF IGNITION OF MIXTURES OF HALOGEN DERIVATIVE HYDROCARBON VAPORS WITH AIR

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 27 Jul 81) pp 477-481

KHRAMOV, V. V., SHCHUSTROV, N. I. and BOBKOV, A. S., Branch of All-Union Scientific Research Chemical-Pharmaceutical Institute imeni S. Ordzhonikidze, Moscow Oblast

[Abstract] An earlier work assumed that the heat necessary to heat a mixture from its initial temperature to the critical temperature was

liberated in the reaction of oxidation of the compound to carbon monoxide and water. Additional studies show that this heat is clearly insufficient. Compensation of the insufficient quantities of heat results from partial oxidation of the compound to carbon dioxide, water and a hydrogen halide. An equation is given for the concentration of carbon dioxide gas in the combustion of mixtures of hydrocarbon halogen derivatives with oxygen. The calculations show that the method suggested for estimating the concentration limits, based on the principle of equal probability of appearance of chain branching and breaking, can be used to predict both the lower and upper limits of ignition of both chlorine and bromine derivatives of saturated hydrocarbons. The concentration limits can be found at any initial temperature.
References 5 (Russian).
[207-6508]

UDC [661.635.2:631.893.123]:533.273

PARTIAL TENSIONS OF COMPONENTS ABOVE MELTS OF NITROAMMOFOS AND NITROAMMOFOSKA AND PRODUCTS OF THEIR CRYSTALLIZATION

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 3, Mar 83 pp 158-159

KONONOV, A. V., LOBACHEVA, M. P., STERLIN, V. N., KARPETSKAYA-SOKOLOVA, S. I. and ZHOKHOVA, T. N.

[Abstract] Partial pressures were measured of NH_3, NH_4Cl, HCl, NO, NO_2 and NO_3^- over solutions and solid crystallization products of NP- and NPK-containing fertilizers. The concentrations of NH_3 increase, of NH_4Cl decrease and of HCl remain fairly constant as the pH of the solution increases from 2.0 to 6.0. HNO_3 is not detected, while the oxides of nitrogen are present in only trace amounts at pH values near 2.0. For the crystallization products at 80°C and pH values 2.2 to 3.5, toxic contaminants are not detected. Traces of ammonia are measured at pH's of 3.8 to 4.0. These data indicate that ammonia is the only toxic gas which must be considered in purifying the atmosphere in fertilizer-handling facilities. Figures 2; references 6 (Russian).
[193-12027]

UDC 661.635.42

RATE OF AMMONIZATION OF DIMAGNESIUM PHOSPHATE TRIHYDRATE

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 3, Mar 82 pp 190-191

BISHKO, Ya. V., VYAZOVOV, V. V. and GRABOVENKO, V. A.

[Abstract] Magnesium ammonium phosphate monohydrate (MAPM) is known to be an effective, slow-acting fertilizer. In its preparation (from NH_3, H_3PO_4, Na and NH_4 phosphates, the MAPM is formed by ammonization of an intermediate product, dimagnesium phosphate trihydrate. The kinetics of this ammonization--to form MAPM--are studied in the article. This reaction is extremely temperature sensitive. For example, at 60°C, the reaction is only about 30% complete after 10 hours. At 90°C, the reaction is essentially

complete after 12 minutes. These kinetic data have importance in preparing time-release fertilizers. [Abstractor's note: There are several apparent discrepancies in the original article; for example, the formula $MgHPO_4$ as given does not correspond to the name "dimagnesium phosphate" and the ammonization reaction equation as given is not properly balanced.]
Figure 1; references 6: 3 Russian, 3 Western.
[193-12027]

UDC 633.11:631.81

WINTER WHEAT RESPONSE TO FERTILIZERS WITH VARIOUS PHOSPHORUS AND PHOSPHORUS-POTASSIUM CONTENTS ON LEACHED-OUT CHERNOZEM OF THE CAUCASUS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 83 pp 9-13

SHIRINYAN, M. Kh., candidate of agricultural sciences, and PONOMARENKO, G.I., Krasnodar Kray Station of Agricultural Chemization

[Abstract] The effects of various high doses of phosphorus and potassium were measured on winter wheat, which followed vetch-fescue fodder, corn or sugar beets in crop rotation. Basic doses were P_{200} to P_{600}, $P_{400}K_{150}$ and $P_{400}K_{300}$; subsequent applications included N_{60} to N_{120} as well as additional P and K. Residual effects of the basic fertilizer applications and the added yields resulting from fertilization following various crops in the rotation are presented. Results indicated that, on the lixiviated chernozem of the Krasnodar kray, application of phosphorus as a reserve fertilizer every five years is as effective as annual doses. The best protein and gluten content in winter wheat came when it followed the vetch-fescue crop. When the wheat followed corn, best results were obtained using nitrogen and nitrogen-phosphorus fertilizers, with gluten content ranging from 27.2 to 29.3%. While high doses of phosphorus and potassium increased their content in the soil, the P content fell annually. The optimal dose of nitrogen for winter wheat was N_{90}. Application of phosphorus alone led to declining grain quality.
[212-12131]

UDC 633.11:631.81

EFFECT OF PREVIOUS CROPS AND FERTILIZERS ON YIELD AND GRAIN QUALITY OF WINTER WHEAT IN UkSSR FOREST STEPPE

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 13-17

YAKIMENKO, V. N. and TESEL'KO, V. L., candidates of agricultural sciences, All-Union Scientific Research Institute for Sugar Beets; ODREKHOVSKIY, A.F., PETROVA, Ye. T. and SIROTA, V. G., candidates of agricultural sciences, Belaya Tserkov' Experimental Genetic Selection Station, All-Union Scientific Research Institute for Sugar Beets

[Abstract] On low-humus deep lixiviated heavy loam chernozem at the Belaya Tserkov' station, aged manure, ammonium nitrate, granulated superphosphate

and 40% potassium salt were applied at plowing to fields which had not been fertilized for the preceding crops of perennial grasses, silage corn and peas. Meteorological conditions in the test years of 1975, 1976 and 1977 varied. Variations in soil fertilizer content and in crop yields by year and in relation to the previous crop indicate that normal fertilizer doses gave dependable yield increases, but increased doses contributed to beating down during most of the test years. While manure produced a slight but dependable increase in yields in most cases at 20t/hectare, increasing that rate had little effect. A second wheat crop without additional fertilizing was significantly lower in yield, although plant diseases had a hand in this decline. Fertilizers often had a negative effect on grain quality, such as protein and gluten content. The authors regard the optimal dose of mineral fertilizers to be $N_{20-40}P_{30-60}K_{30-60}$ for the conditions at the test plots with 20 ton/hectare of manure. Perennial grasses and corn were practically equal as predecessors. References 2 (Russian).
[212-12131]

UDC 633.11:631.811.6

EFFECT OF MAGNESIUM FERTILIZERS ON YIELD AND GRAIN QUALITY OF WINTER WHEAT

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 17-20

AL'SHEVSKIY, N. G., candidate of agricultural sciences, Zhitomir Agricultural Institute, and DEREBON, Yu. G., candidate of agricultural sciences, Zhitomir Zone Agrochemical Laboratory

[Abstract] The authors studied the effects of magnesium on sprouting, wintering yield and grain quality of Mironovskaya 808 winter wheat. Dolomite powder with 18.9% MgO and epsomite with 15.6% MgO were applied in the fall prior to planting or in early spring together with ammonium nitrate on moderately acid, sandy, low-humus podzol soil with little free potassium, phosphorus or magnesium. Results indicated that the fertilizer had little effect on sprouting, which was 65-67%, but the magnesium enhanced winter hardiness by promoting more sugar storage in the plants. Climatic problems, drought in 1979 and too much moisture in 1980, had severe effects on the winter wheat in the tests. Dolomite was clearly more effective when applied in the fall; in general, epsomite was a better source of magnesium, which contributed to increased grain mass and protein and gluten content. Under the given conditions the use of magnesium fertilizer is economically beneficial. References 10 (Russian).
[212-12131]

UDC 633.11:631.816.2

MINERAL FERTILIZER EFFECTS ON SPRING WHEAT AT VARIOUS APPLICATION TIMES

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 20-22

AVER'YANOV, G. D. and MATYUSHIN, M. S., candidate of agricultural sciences, Tatar Scientific Research Institute for Agriculture

[Abstract] Field tests in the Tatar ASSR on heavy forest loam, dark gray soil involved hand application of double superphosphate, ammonium nitrate and 40% potassium salt in the fall at cultivation and spring before planting. Both plowing and disking to 30 cm were used for cultivation. Varying temperature and moisture conditions affected the tests, but results indicated that the time of fertilizer application and the method of cultivation were reflected in yields and quality of spring wheat. CO_2 content was 653 mg per unit with disking and only 415 mg with plowing. Best CO_2 emanation from the soil based on fertilizer application time came with spring application during preplanting cultivation. $N_{60}P_{60}K_{45}$ in the fall increased yield 4.6 centners/hectare; applied after plowing, it boosted yield 7 centners. Gluten content increased by 4.5-5.5% with spring fertilization, but did not change with fall application. The method of cultivation did not directly affect fertilizer effectiveness.
[212-12131]

UDC 541.183+638.54

STRUCTURAL CHANGES IN ION EXCHANGERS DURING ION EXCHANGE AND THEIR MANIFESTATION DURING STUDY OF ION EXCHANGE EQUILIBRIA

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (mansucript received 24 Apr 81) pp 19-28

TARASEVICH, Yu. I., Institute of Colloid Chemistry and Water Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] This is a review-type article. Natural and synthetic zeolites, laminated silicates, alkali-borate glass, zirconyl phosphate ion exchangers and other compounds have been used to study the structural changes in an ion exchanger during ion exchange. Phase transitions of first and second kind in the ion exchanger matrix were considered when some cations were replaced by others. The same changes in the ion exchangers were manifested on the isotherm of ion exchange and the dependence of the adjusted corrective factor on the degree of exchange. The phenomenon of exchange cation segregation was discussed with respect to ion exchange being considered as a cooperative phenomenon based on molecular-statistical thermodynamics of phase transitions in solids. The data can be used in rational selection of ion exchangers, conditions of water treatment processes and separation of ion mixtures. Figures 2, references 69: 32 Russian, 37 Western.
[157-6521]

UDC 628.543.4

EVALUATION OF PROCESS FOR REGENERATING KU-2-8 CATION EXCHANGE RESIN USED FOR ION EXCHANGE REMOVAL OF COPPER FROM WASTE WATER

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 3, Mar 82 pp 21-22

KARELIN, Ya. A., doctor of technical sciences, Moscow Construction Engineering Institute imeni V. V. Kuybyshev, and YAKUBOVSKIY, Ye. P., engineer, Brest Engineering-Construction Institute

[Abstract] A laboratory study was conducted to determine the optimum sulfuric acid concentration for the title process. A parameter called specific

consumption, defined as the ratio of the actual equivalents of acid flowing through the column to the equivalents of copper adsorbed on the resin, is used as a measure of efficiency. The most efficient operating regime is use of 1.0 N sulfuric acid which results in 75 to 80% regeneration for a specific comsumption of about 6. A counterflow method allows for an increase in both the resulting purity and the volume of water processed. Figures 4; references 5 (Russian).
[192-12027]

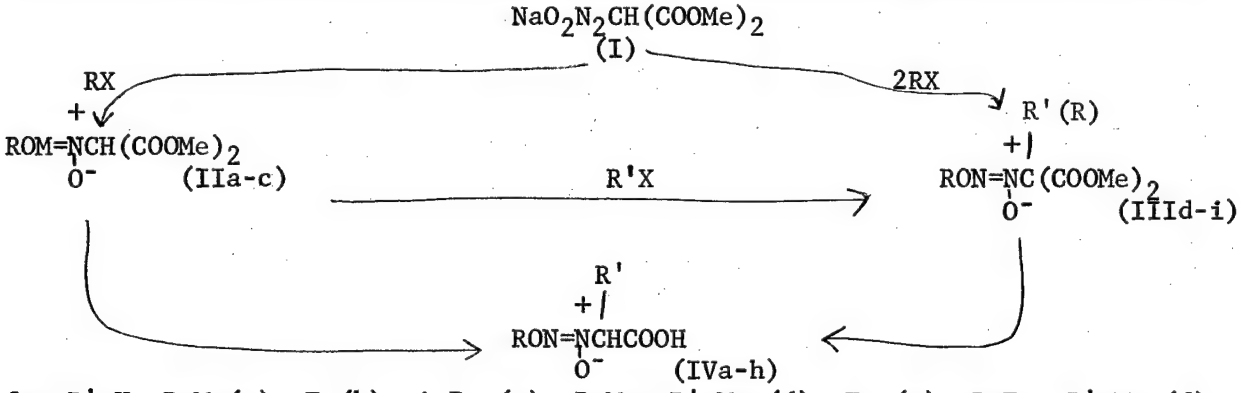
UDC 547.235.5

AZO- AND AZOXY- COMPOUNDS, PART 6: SYNTHESIS OF 1-OXIDO-2-ALKOXYDIAZENMALONIC ETHERS

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 18, No 3, Mar 82 (manuscript received 27 Mar 81) pp 503-508

YANDOVSKIY, V. N., FROLOVA, G. M. and TSELINSKIY, I. V., Leningrad State University imeni A. A. Zhdanov; Leningrad Technological Institute imeni Lensovet

[Abstract] Nitrous oxide reacts with the dimentyl esters of malonic acid in methanol in the presence of sodium methylate; subsequent alkylation leads to the formation of the title compounds. The reaction scheme is as follows:



for R'=H, R=Me(a), Et(b), i-Pr (c); R=Me, R'=Me (d), Et (e), R=Et, R'=Me (f), Et (g); R=i-Pr, R'=Me (h), i-Pr (i). Experimental conditions, product descriptions and structural configurations are given. References 6: 2 Russian, 4 Western.
[189-12027]

UDC 547.235.5

AZO- AND AZOXY- COMPOUNDS, PART 7: SYNTHESIS AND PROPERTIES OF 1-OXIDO-2-ALKOXYDIAZENACETIC ACIDS

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 18, No 3, Mar 82 (manuscript received 27 Mar 81) pp 508-514

YANDOVSKIY, V. N., KUZNETSOV, V. S., TSELINSKIY, I. V. and FROLOVA, G. M., Leningrad State University imeni A. A. Zhdanov; Leningrad Technological Institute imeni Lensovet

[Abstract] Alkylation of the disodium salt of N-nitrosohydroxylaminoacetic acid with dimethylsulfate or alkyl iodides results in the formation of 1-oxido-2-alkoxydiazene acetic acids (IV). Alkylation of (IV) in alcohol or DMSO gives the monosubstituted derivative (V); in THF, the dialkyl derivative is formed (VI). Dialkyl esters of (VI) may be synthesized in a similar manner. Hydrolysis of compounds (IV), (V) and (VI) in 5.6% KOH results in formation of 1-oxido-2-alkoxydiazenacetic acids (VII) differing from compounds (IV) in that the acids of (VII) contain two additional alkyl groups. Compounds (VII) can be easily methylated, thereby forming a new series of esters (VIII). Alkyl groups considered include methyl, ethyl, isopropyl and butyl. Synthesis, structural information and confirmation are given. References 4: 2 Russian, 2 Western.
[189-12027]

UDC 547.235.41+541.141.8+547.473.1

SYNTHESIS AND PROPERTIES OF 2-DIAZO-1,3-DICARBONYL COMPOUNDS, PART 5: SYNTHESIS AND 1,2-NUCLEOPHILIC REARRANGEMENTS OF SOME 2-DIAZO-3-OXY-1-CYCLOHEXANONES

Leningrad ZHURNAL ORGANICHESKOY KHIMII in Russian Vol 18, No 3, Mar 82 (manuscript received 15 Jun 81) pp 559-572

NIKOLAYEV, V. A., ZHDANOVA, O. V. and KOROBITSYNA, I. K., Leningrad State University imeni A. A. Zhdanov

[Abstract] Compounds of the type 2-diazo-3-oxy, 2-diazo-3-oxy-5,5-dimethyl and 2-diazo-3-4,4,6,6-tetramethyl-cyclohexanones are obtained via the reduction of a series of 2-diazo-1,3-diketones. Photolytic, catalytic and thermal elimination of nitrogen from the diazo group is accompanied only by 1,2-nucleophilic rearrangements. For the photolysis of the dioxyketones, in contrast to the other diazoxycarbonyl compounds and in a manner analogous to diazoketones which do not contain oxygen, the principle direction of the reaction is the migration of the radical on the acyl group, resulting in a shrinking of the ring. The products are oxyacids and unsaturated acids typical of the Wolf rearrangement. Two mechanisms are observed during the

descruction of the cyclic diazoxyketones: most common is the 1,2-alkyl shift or less frequently, the hydride shift. Migration of the acyl radical is not observed. Under thermal conditions, however, both radicals migrate concurrently. References 20: 5 Russian, 15 Western.
[189-12027]

UDC 547.886

INTERACTION OF CHLOROSUBSTITUTED 1,3,5-TRIAZA-2-PHOSPHORINES WITH SODIUM THIOPHENYLATE, PHENYLATES AND ALCOHOLATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 31 Jul 81) pp 590-597

KORNUTA, P. P., KOLOTILO, N. V. and MARKOVSKIY, L. N., Institute of Organic Chemistry, Ukrainian Academy of Sciences

[Abstract] Continuing the study of the variation in sequence of substitution of chlorine atoms in 2,2,4-trichloro-1,3,5-triaza-2-phosphorines, the authors studied the reaction of chlorosubstituted triazaphosphorines with sodium thiophenylate, phenylate and alcoholate. With sodium thiophenylate, substitution of the chlorine atom occurs at the carbon, with methylate and phenylate at both electrophilic centers. 2,2,2-Trialkoxy(aroxy)-6-phenyl-1,3,5-triaza-2-phosphorines are produced. The alkoxy derivatives of triazaphosphorines are thermally unstable and undergo regrouping upon heating accompanied by intramolecular alkylation of the nitrogen atoms of the ring. References 6: 5 Russian, 1 Western.
[187-6508]

UDC 542.945+542.957.2+546.19+541.142.7

ELECTRON INFLUENCE OF ORGANIC ARSENIC SUBSTITUENTS WITH THREE COORDINATION ARSENIC ATOM

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 15 Jan 81) pp 602-607

GAVRILOV, V. I. and KHUSNUTDINOVA, F. M., Kazan' Institute of Chemical Technical imeni S. M. Kirov

[Abstract] A study is made of the acid-base properties of substituted dimethylanilines, including those containing an organic arsenic group. The relative acidity constant were determined by potentiometric titration with perchloric acid in a medium of acetic anhydride at 25°C. Comparison

of σ constants for meta- and para-organic arsenic substituents indicates that in all cases the σ_m constants are greater than the corresponding values of σ_n. This means that the acceptor nature of the influence of the arsenic-containing groups is greater from the meta-position than from the para-position. The total electron influence of organic arsenic substituents containing the three coordination arsenic atom on the distribution of electron density in the benzene ring consists of these acceptor inductive and donor resonance effects. The inductive effect is thus significantly stronger than the resonant effect. References 18: 17 Russian, 1 Western. [187-6508]

UDC 547.242

ASYMMETRICAL ORGANIC ARSENIC COMPOUNDS WITH As-N BOND, PART 5: BREAKING OF As-N BOND UNDER INFLUENCE OF ALCOHOLS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82 (manuscript received 8 Apr 81) pp 607-610

YAMBUSHEV, F. D., TENISHEVA, N. Kh., NIKIFOROV, M. D., KOKOREV, G. I., FEDOTOV, B. G. and BESPALOV, Yu. A., Kazan' State Pedagogic Institute; "Plastpolimer" Scientific-Production Association, Okhta

[Abstract] A study is presented of the interaction of aminoarylalkylarsines with proton active reagents such as monohydric alcohols. It was expected that alcoholysis would cause asymmetrical aminoarsines to undergo conversion leading to the synthesis of representatives of an important class of organic arsenic compounds, arsinous acid esters. Asymmetrical amino-, N,N-dimethylamino-, N,N-diethylaminoethylphenyl-, o,m,p-tolyl-, o-,m-,p-anisylarsines were used to study the reaction. The probable mechanism of the reaction is nucleophilic substitution S_N2, and it results in the production of methyl, ethyl and propyl esters of ethylarsinous acids. References 4 (Russian). [187-6508]

UDC 548.737

X-RAY STRUCTURAL STUDY OF NON-VALENT REACTIONS AND COORDINATIONS IN METALLOORGANIC COMPOUNDS, PART 21: CRYSTALLINE STRUCTURES OF 2-PHENYLSULFONYLIMINO-1,2-DIHYDROTHIAZOLE AND ITS N-PHENYLMERCURIC DERIVATIVE

Novosibirsk ZHURNAL STRUKTURNOY KHIMII in Russian Vol 23, No 1, Jan-Feb 82 (manuscript received 30 Jan 81) pp 102-110

KUZ'MINA, L. G., STRUCHKOV, Yu. T., KRAVTSOV, D. N. and GOLOVCHENKO, L. S., Institute of Hetero-Organic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences

[Abstract] Many heterocyclic N-acyl-amines exist as either amines or imines in the solid state, with dynamic balance between the two. The structure of acylamino-N-heterocycles in solution and in crystals has been studied

by ultraviolet and infrared spectroscopy (Sheyker et al, 1959); the present authors studied the title compounds by X-ray structural analysis, the first by a direct MULTAN program method and the second by a heavy atom and some of the least squares method first in isotropic, then in anisotropic approximation. Results show that the dimer in crystals is an intermediate transitional state of tautomeric conversions, probably taking place in a bimolecular mechanism. In the second compound the Hg atoms of both independent molecules have highly similar structures, indicating favorable geometric conditions for metallotropic processes. Figures 3, references 13: 7 Russian, 6 Western. [211-12131]

UDC 542.241+542.384

ALKYLATION OF POTASSIUM SALTS OF DITHIOPHOSPHORIC ACIDS BY BROMOACETYLENE ALCOHOLS

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 3, May-Jun 81 (manuscript received 5 Sep 79) pp 77-78

ASHYMBAYEVA, B., BEYSHEKEYEV, Zh., DZHUNDUBAYEV, K. D. and TOKTOBEKOVA, T., Institute of Organic Chemistry, KiSSR Academy of Sciences

[Abstract] The title alkylation has been studied for the first time. The reaction took place in acetone, starting at room temperature with a subsequent heat increase to the boiling point. The structures of the compounds obtained were confirmed by elemental analysis, thin layer chromatography and infrared spectroscopy. They consisted of red, sluggish oils that dissolved in ethyl acetate, alcohol, acetone and ethyl ether, but not in benzene, toluene, cyclohexane or water. References 4 (Russian.)
[115-12131]

UDC 547.241+541.127

QUANTITATIVE ANALYSIS OF INFLUENCE OF STRUCTURE OF COMPOUNDS OF FOUR-COORDINATED PHOSPHORUS ON REACTIVITY OF THESE COMPOUNDS

Moscow USPEKHI KHIMII in Russian Vol 51, No 3, Mar 82 pp 394-411

ISTOMIN, B. I. (deceased and BARANSKIY, V. A., Irkutsk State University imeni A. A. Zhdanov

[Abstract] This work presents a literature review on the influence of the structure of substituents on the reactivity of organic compounds and formulates an axiomatic structure for correlation analysis, consisting essentially of the following postulates: 1) three types of intramolecular interaction are possible between uncharged fragments in organic molecules: induction, steric and resonant; 2) a change in free energy in the process of a reaction or activation can be represented as the sum of the contributions by these interactions; 3) the principle of linearity of free energy is

applicable to each of these contributions; 4) the contribution of any interaction between two structural fragments is proportional to the product of the corresponding constants characterizing the capability of the fragments for the type of reaction in question; and 5) among charged fragments, in addition to these types of interactions, electrostatic interaction is also possible, described by a mathematical model and inversely proportional to the macroscopic dielectric constant of the medium. The influence of structural factors on the dissociation of organic acids is compared and the problem of nonadditive effects of substituents at a four-coordinated phosphorus atom is discussed. The most unexpected result of the entire study is the good linear relationship between the contributions of substituents with reaction centers = P(O)OH and -COOH, as well as the similarity of the relationship between induction and resonance contributions to the summary effect of substituents for the dissociation series of acids. Figures 5; references 104: 72 Russian, 32 Western.
[196-6508]

UDC 547.241

α-ALKOXYALKYL COMPOUNDS OF PHOSPHORUS AND SOME OF THEIR ANALOGS

Moscow USPEKHI KHIMII in Russian Vol 51, No 3, Mar 82 pp 412-437

PETROV, K. A., CHAUZOV, V. A. and AGAFONOV, S. V.

[Abstract] α-Alkoxyalkyl derivatives have been greatly studied in recent years. They are synthesized using original and convenient methods of synthesis and several areas of practical use have been found. This review article discusses the chemistry of these compounds. Methods of synthesis, properties and applications are outlined. They are recommended for use as pesticides, in medicine as antienzyme preparations and antibiotics, as extraction agents for uranium and thorium, as complexons for preventing deposition of salts, as fire suppressing additives to polymers and textiles and as effective solvating substances. References 305: 227 Russian, 78 Western.
[196-6508]

UDC 547.26'118

REACTION OF P(IV) THIOCIDS WITH PHENYLCYANATE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82 (manuscript received 15 May 81) pp 482-487

ZIMIN, M. G., KAMALOV, R. M., CHERKASOV, R. A. and PUDOVIK, A. N., Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] A study is made of the reaction of diethyl-, diisopropyldiothiophosphoric and diisopropylmonothiophosphoric acids with phenylcyanate. The reactions of the dithioacids of phosphorus involve a strong exothermic effect and are significantly easier to perform than with thiocyanobenzene.

In all cases small quantities of a phenylcyanate trimer, triphenylcyanurate, were formed. The main products of the reaction are N-(O,O-dialkylthiophosphoryl)-O-phenylthionocarbamates, dialkylesters of isothiocyanatothiophosphoric acid, phenol, tetraalkyltrithiopyrophosphates and O-phenylthiocarbamate. The phenylthiocarbamates are unstable and break down into phenol and dialkyl esters of isothiocyanatothiophosphoric acid. The products of attachment also react with the second molecule of dithiophosphoric acid, leading to the formation of O-phenylthione carbamate and tetraalkyltrithiopyrophosphates. References 23: 16 Russian, 7 Western.
[187-6508]

UDC 547.26'118

INTERACTION OF 2,2-DIETHOXY-2-PHENOXY-4,5-DIMETHYL-1,3,2-DIOXAPHOSPHOLENE WITH CARBOXYLIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82 (manuscript received 4 Jun 81) pp 487-491

GAZIZOV, T. Kh., BELYALOV, R. U. and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate, USSR Academy of Sciences

[Abstract] Diethylphenylphosphite interacts with acetic acid to form diethylphosphorous acid and phenylacetate. A study is made to see whether anion exchange can occur in this type of reaction among the components of stages 2,3 and 4 in the reaction sequence. The reaction of 2,2-diethoxy-2-phenoxy-4,5-dimethyl-1,3,2-dioxaphospholene with acetic acid and trifluoroacetic acid was studied, yielding diethyl-α-acetoethylphosphate, phenyl acetate, diethylphenylphosphate and α-acetoethyl acetate. It is concluded that in quasiphosphonium compounds when alkoxy-, phenoxy- and acetoxy groups are simultaneously present at the phosphorus atom, the second stage of the Arbuzov reaction can occur and ionization of the phenoxy group by anion exchange can achieve deacetylation of the intermediate product. If the intermediate product contains the less basic trifluoroacetoxy group, ionization occurs primarily at this group and the process ends with dealkylation of the intermediate product. References 13: 9 Russian, 4 Western.
[187-6508]

UDC 542.91+547.794.2.118

SYNTHESIS AND CERTAIN PROPERTIES OF 1,3,2-OXAZAPHOSPHOLANES WITH P-C BOND

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 4 Jun 81) pp 491-498

PUDOVIK, M. A., TERENT'YEVA, S. A. and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate USSR Academy of Sciences

[Abstract] A comparative study is presented of the stability and paths of transformation of P-alkylated and arylated oxazaphospholanes not containing a condensed phenylene system. The interaction of tetraethyldiamidoalkyl (phenyl)phosphonite with ethanolamine yielded 2-alkyl(phenyl)-1,3,2-oxazaphospholanes, which are converted to oligomers and, upon heating, to spirophosphoranes with the P-C bond. 1,3,2-oxazaphospholanes are silylated and phosphorylated at the secondary amino group in the ring. In the reaction of oxazaphospholanes, containing the P-C bond, with acrylonitrile, cyclic imidophosphinates are formed which dimerize reversibly to diazadiphosphetidines. The interaction of 2-phenyl-1,3,2-oxazaphospholane with pyrocatechin yields spirophosphorane with the P-C bond, while when diethylamine is present this reaction yields a derivative of the hexacoordination phosphorus atom. References 11: 8 Russian, 3 Western.
[187-6508]

UDC 547.26'118

SYNTHESIS AND CERTAIN PROPERTIES OF DIALKYLDITHIOANILIDOPHOSPHITES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
manuscript received 29 Jun 81) pp 498-501

KOSTON, V. P., SINYASHIN, O. G., BATYYEVA, E. S. and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate USSR Academy of Sciences

[Abstract] Dialkyldithiophosphorous acid anilides were obtained, by analogy with the synthesis of dialkylphosphorous acid anilides, from dimethyl and diethyldithiochlorophosphites and aniline. The structure of the products produced was proven by physical-chemical methods, and also by comparison of physical constants to the literature data. The compounds interact with proton-donor reagents with substitution of the amide group and attach to acrylonitrile to form products with a phosphimide bond. References 6: 5 Russian, 1 Western.
[187-6508]

UDC 547.26'118

REACTION OF S-TRIMETHYLSILYLDITHIOPHOSPHATES WITH ISOCYANATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 6 Jul 81) pp 501-509

KUTYREV, G. A., LYGIN, A. V., CHERKASOV, R. A. and PUDOVIK, A. N., Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] A study is made of the interaction of S-trimethylsilyldithiophosphates with isocyanate, to determine the influence of the structure of phosphorus and unsaturated reagents on the direction of the reaction. It is shown that O, O-dialkyl-S-trimethylsilyldithiophosphates can attached at the NCO group of organylisocyanates. Further stabilization of the intermediate adducts formed depends on the nature of the substituent at the nitrogen atom of the isocyanate. When silyldithiophosphates interact with acylisocyanates, attachment occurs at the conjugate system of O=C-N=C=O bonds. Cyclical silyldithiophosphates react with isocyanates in an O, S-exchange process. References 13: 8 Russian, 5 Western.
[187-6508]

UDC 542.91:661.718.1

INTERACTION OF 2-MONOANILS OF 1,2,3-TRICARBOXYLIC COMPOUNDS WITH DIMETHYLPHOSPHOROUS ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 3 Jul 81) pp 509-513

ARBUZOV, B. A., POLEZHAYEVA, N. A. and OVODOVA, O. V., Scientific Research Institute of Chemistry imeni A. M. Butlerov of the Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] A study was made of the interaction with dimethylphosphorous acid of a) 1,3-diphenylpropane-1,2,3-trion 2-monoanil; b) 1,3-dimethylpropane-1,2,3-trion 2-p-dimethylaminoanil; and c) α-p-dimethylaminoanil of ethyl ester of α,β-diketobutyeric acid. All these compounds react with dimethylphosphorous acid in the presence of triethylamine at room temperature to form α-oxyphosphonates, which are present in solutions of low concentration (10^{-3}-10^{-4} mol/ℓ) primarily as monomer molecules with intramolecular hydrogen bonds. References 18: 8 Russian, 10 Western.
[187-6508]

UDC 547.558.1

CHARGE DELOCALIZATION IN ARYLATED AMIDE AND PHOSPHIDE ANIONS ACCORDING TO ^{13}C NMR DATA

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 17 Jun 81) pp 513-516

BERESTOVA, S. S., TEREKHOVA, M. I., BONDARENKO, N. A., BOGACHEV, Yu. S., PETROV, E. S., TSVETKOV, Ye. N. and SHATENSHTEYN, A. I., Physical and Chemical Scientific Research Institute imeni L. Ya. Karpov, Moscow; Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka

[Abstract] The method of ^{1}H and ^{13}C NMR spectroscopy was used to study aniline, diphenylamine, phenyl and diphenylphosphine as well as their lithium derivatives in DMSO. The results produced show that chemical shifts of protons on the benzene ring in amides and phosphides of lithium in DMSO are similar to the corresponding values of δ_H for potassium derivatives in THF. During acid ionization of diphenylamine and diphenylphosphine, the total high electron delocalization increases more than during ionization of aniline and phenylphosphine. Thus opposite trends in the influence of the second phenyl group on the strength of NH and PH acids are not related to changes in high electron delocalization upon ionization. References 6: 5 Russian, 1 Western.
[187-6508]

UDC 541.121.543.241.5:547.1'118

EQUILIBRIUM PH ACIDITY OF CERTAIN PRIMARY AND SECONDARY ARYLPHOSPHINES IN DIMETHYLSULFOXIDE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 17 Jun 81) pp 516-519

TEREKHOVA, M. I., BONDARENKO, N. A., MALAKHOVA, I. G., TSVETKOV, Ye. N., PETROV, E. S. and SHATENSHTEYN, A. I., Physical and Chemical Scientific Research Institute imeni L. Ya. Karpov, Moscow; Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka

[Abstract] Remetallization in DMSO was used to determine the pK of certain aryl-, diaryl- and alkylphenylphosphines, related to the pK scale of CH acids in this solvent. The pK values show that the phosphines in question are weak acids, but stronger than the NH acids of similar structure. The PH acidity decreases significantly under the influence of alkyl groups; the introduction of a second aryl group to monoarylphosphines results in some decrease in PH acidity, still more when alkyl groups are introduced to phenylphosphine. It is assumed that the p-nature of the free electron pair orbitals of diarylphosphide anions increases with increasing valence angles at the phosphorus atom upon secondary substitution. References 20: 11 Russian, 9 Western.
[187-6508]

UDC 547.341

SYNTHESIS OF DIALKYL ESTERS OF 3-ETHYLTHIO-1,3-BUTADIENE-2-PHOSPHONIC ACID

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 21 May 81) pp 520-524

BREL', V. K., DOGADINA, A. V., IONIN, B. I. and PETROV, A. A., Leningrad Institute of Technology imeni Lensovet

[Abstract] It is shown that when the dialkyl esters of 1-methoxy-2,3-butadiene-2-phosphonic acid interact with ethylmercaptans in the presence of sodium mercaptide, first attachment of the mercaptan at the allene system double bond closest to the phosphorus atom occurs forming 4-methoxy-2-ethylthio-1-butene-3-phosphonates. These have proven to be extremely labile compounds, undergoing prototropic transformation with movement of the double bond to the phosphorus-containing group even in the process of synthesis, leading to the formation of 1-methoxy-3-ethylthio-2-butene-2-phosphonates. The products were identified by NMR spectroscopy. Heating of the products of nucleophilic attachment of mercaptan in a vacuum with sodium alcoholates produces 1,4-splitting of the alcohol to form 3-ethylthio-1,3-butadiene-2-phosphonic acid esters. Figures 2; references 8 (Russian).
[187-6508]

UDC 547.241

INTERMEDIATE COMPOUNDS IN ARBUZOV REACTION IN SERIES OF FLUORINE-CONTAINING PHOSPHONITES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 3 Jul 81) pp 529-532

MASLENNIKOV, I. G., LAVRENT'YEV, A. N., PROKOF'YEVA, G. N. and ALEKSEYEVA, T.B. Leningrad Institute of Technology imeni Lensovet

[Abstract] Continuing work on the study of the reaction of methyliodide with fluorine-containing trivalent phosphorus acid esters, the authors found that the intermediate compounds in the Arbuzov reaction can be extracted in the case of 2,2,2-trifluoroethyl esters of alkylphosphonous acids. Thus, when a mixture of bis(2,2,2-trifluoroethyl)ethylphosphonite and methyliodide are stored for several days at room temperature, colorless crystals are formed, in oluble in nonpolar media such as ether, benzene and hexane, quite soluble in polar media such as water, acetonitrile and nitromethane. Determination of ionic iodine from an aqueous solution of the compound yielded an iodine content corresponding to that in a quasiphosphonium compound. It is concluded that a quasiphosphonium compound is formed as the intermediate compound in the Arbuzov reaction in thes case. Decreasing the electron density at the phosphorus atom results in significant slowing of the Arbuzov reaction. References 13: 10 Russian, 3 Western.
[187-6508]

UDC 661.718.1

COMPLEXES OF IODOHEPTAFLUOROPROPANE WITH DIETHYLPHOSPHINOUS ACID AMIDES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 3 Jul 81) pp 532-533

SHIBAYEV, V. I., GARABADZHIU, A. V. and LAVRENT'YEV, A. N., Leningrad Institute of Technology imeni Lensovet

[Abstract] IR spectroscopy in the 400-200 cm^{-1} range was used to study the interaction of iodoheptafluoropropane with diethyl and diphenyl (diethylamino) phosphine (I and II). A new absorption band at 264 cm^{-1} was found in the complex of iodoheptafluoropropane with I. A similar band in complexes of iodoheptafluoropropane with trialkyamine was previously explained as valent oscillation of the C-I bond with coordination at the nitrogen atom, which is considered probable in this case as well. The iodine atom in iodoperfluoroalkanes is a "harder" acid than the positively charged iodine atoms in compounds not having the perfluoroalkyl group. References 6: 2 Russian, 4 Western.
[187-6508]

UDC 547.341

INFLUENCE OF SUBSTITUENTS AT ALLENE BOND ON DIRECTION OF REACTION OF ALKYLSULPHENYLCHLORIDES WITH 1,2-ALKADIENEPHOSPHONATES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 7 May 81) pp 538-543

ANTELOV, Kh. M., VACHKOV, K. V., KIRILOV, M. and LEBEDEV, V. B., Higher Pedagogic Institute of Shumen City, Peoples Republic of Bulgaria; Leningrad Institute of Technology imeni Lensovet

[Abstract] To study the influence of substituents at the allene group on the direction of the reaction in the title, the authors studied the reaction of alkylsulphenylchlorides with 1,2-alkadienephosphonic acid dialkyl esters containing various substituents at carbon atoms 1 and 3 of the allene bond. It was determined that propadiene phosphonic acid esters interacting with alkylsulphenylchlorides primarily yield products of attachment at the C_2-C_3 double bond. The direction of the reaction depends strongly on the quantity and nature of substituents at the allene bond. It is shown that, upon transition from the tertiary C^3 atom to a primary atom, the reaction moves from cycloattachment of the reagent in the direction of attachment at one of the double bonds. References 7 (Russian)
[187-6508]

UDC 547.415.1

AMIDATION OF TRIVALENT PHOSPHORUS ACID CHLORIDES BY BIS(DIALKYLAMINO)METHANES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 16 Jul 81) pp 562-566

KUKHAR', V. P. and SHEVCHENKO, M. V., Institute of Organic Chemistry, Ukrainian Academy of Sciences

[Abstract] A study was made of the reaction of phosphorus trichloride with dimorpholino and dipiperadino methanes, producing the expected morpholinodichlorophosphite and piperadinodichlorophosphite. In contrast to this, phosphorus tribromide reacts only with 1 mol of bis(dimethylamino)methane to form dimethylamidodibromophosphite. Deeper substitution of bromine atoms cannot be achieved even with a large excess of aminomethane. Phenyldichlorophosphine and phenyldichlorophosphite react with bis(dimethylamino)methane as does phosphorus trichloride. The reaction of bis(dimethylamino)methane with ethyldichlorophosphate is more complex. Bis(dialkylamino)methanes interact with P-Cl compounds to form amide derivatives of phosphorus and N,N-dialkylmethaniminium chloride. Compounds with the P-H bond also form amide derivatives in the reaction with bis(dialkylamino)methanes and carbon tetrachloride. References 4 (Western).
[187-6508]

UDC 547.26'118

DERIVATIVES OF 4-OXO-1,3,4-OXAZAPHOSPHOLINES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 16 Jul 81) pp 566-573

PALIYCHUK, Yu. A., KOZHUSHKO, B. N. and SHOKOL, V. A., Institute of Organic Chemistry, Ukrainian Academy of Sciences

[Abstract] The authors previously synthesized alkoxycarbonylamides and arylaminocarbonylamides of α-alkoxy-α-chloroalkylphosphonic acid alkyl esters. They contain a structural group of atoms which easily cyclize to oxazoladine or oxazoladone derivatives. Studies were performed to see if the same type of N-phosphprylated urethanes and urea would cyclize in the same way. The study showed that when triethylamine acts on a solution or suspension of alkoxycarbonylamides of α-alkoxy-α-chloroalkylphosphonic acid alkyl esters in ether or benzene at 20°C, the hydrogen chloride is quite easily split forming derivatives of 4-oxo-1,3,4-oxazaphospholine--a new type of heterocyclic compound of phosphorus. References 7 (Russian).
[187-5608]

UDC 542.91+661.718.1

SYNTHESIS OF CERTAIN PHOSPHORYLATED ANTHRANILIC ACID ESTERS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 15 Jun 81) pp 574-577

GRECHKIN, N. P., NIKONOROVA, L. K. and ZHELONKINA, . A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate, US R Academy of Sciences

[Abstract] Continuing studies in the area of phosphorylated amino acid derivatives, the authors synthesized a number of phosphorylated anthranilic acid esters. Two methods were used to synthesize phosphorylated anthranilic acid esters. The first was by interacting anthranilic acid esters with trivalent phosphorus acid chlorides in the presence of triethylamine, then extracting the reaction products by vacuum distillation. The second method was reamidation of dialkylphosphorus acid amides with anthranilic acid esters. Phosphorylation is performed at 115°C in an equimilar mixture of the reagents, and diethylamine is extracted at 75-80% of the theoretical yield. Dialkyl-(o-carbalkoxyphenyl) amidothio(seleno)phosphates are synthesized by attachment of sulfur and selenium to the dialkyl(o-carbalkoxyphenyl)amidophosphates synthesized in the second reaction. References 7: 5 Russian, 2 Western.
[187-6508]

UDC 547.26'..8

REACTIONS OF PHOSPHORUS-CONTAINING DISULFIDES: INTERACTION OF BIS(DIALKOXY-PHOSPHORYL)DISULFIDES WITH DIAZOMETHANE AND DIAZOACETIC ESTER

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 26 May 81) pp 597-601

KHASKIN, B. A., SHELUCHENKO, O. D. and TORGASHEVA, N. A., All-Union Scientific Research Institute of Chemical Means of Plant Protection

[Abstract] Continuing their study of the reaction of bis(dialkoxyphosphoryl) disulfides with diazo compounds, the authors studied their interaction with diazoacetic ester under conditions excluding the formation of ethoxycarbonyl-carbene. As with diazomethane, two possible directions of the reaction were found: injection of an ethoxycarbonylmethylene group into the molecule of the initial disulfide forming products of phosphoryl-thiophosphoryl regrouping, previously unknown dialkoxythiophosphoryloxy-dialkoxyphosphorylthioethoxy-carbonylmethanes, as well as injection of an ethoxycarbonylmethylene group into both P-S bonds of the disulfide forming bis(dialkoxyphosphonoethoxy-carbonylmethyl)disulfides, not previously described in the literature. Apparently both competing reactions occur at different rates. References 4 (Russian).
[187-6508]

UDC 547.461.3+547.831

REACTION OF DICHLOROMALONIC ACID BISARYLIMIDOYL CHLORIDES WITH TRIETHYLPHOSPHITE: METHOD OF SYNTHESIS OF DIALKOXYPHOSPHONYLQUINOLINE SUBSTITUENTS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 9 Jul 81) pp 704-705

SHIVANYUK, A. F., LOZINSKIY, M. O. and KALININ, V. N., Institute of Organic Chemistry, Ukrainian Academy of Sciences, Kiev

[Abstract] The authors were the first to discover that dichloromalonic acid bisarylimidoyl chlorides react with triethylphosphite in toluene under boiling conditions to form unknown 2-diethoxyphosphonyl-3-chloro-4-arylaminoquinolines with good yields. The products are apparently produced initially through the stage of formation of a product of Arbuzov regrouping with subsequent attack of triethylphosphite on the CCl_2 electrophilic center and formation of ketenimine with subsequent cyclization. The composition of the compound was verified by UV, IR and PMR spectroscopy. Reference 1 (Russian).
[187-6508]

UDC 547.26'118

INTERACTION OF DIETHYL(N-BUTYL-N-ISOBUTENYLAMINO)PHOSPHITE WITH CARBOXYLIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82
(manuscript received 10 Jun 81) p 706

GAZIZOV, T. Kh., KIBARDIN, A. M. and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate USSR Academy of Sciences

[Abstract] The authors found that, in reactions of diethyl(N-butyl-N-isobutenyl-amino)phosphite (I) with carboxylic acids, for exhaustive formation of the corresponding dialkylacylphosphites an excess of acid is not required. Interaction of phosphite (I) with acetic acid (II) and isobutyric acid (III) in a ratio of 1:1 at 0-10°C for 1 hour produced diethylacetylphosphite and diethylisobutyrylphosphite. The yield of diethylacetylphosphite was 58%, of diethylisobutyrylphosphite 86.5%. References 4 (Russian).
[187-6508]

UDC 541.124.7+547.1'118

SYNTHESIS AND REACTIVITY OF 7-MEMBERED CYCLOPHOSPHOROUS ACIDS WITH AROMATIC SUBSTITUENTS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82 (manuscript received 7 Jul 81) pp 707-708

OVCHINNIKOV, V. V., CHERKASOVA, O. A. and VERIZHNIKOV, L. V., Kazan' State University imeni V. I. Ul'yanov-Lenin; Kazan' Institute of Chemical Technology imeni S. M. Kirov

[Abstract] A previous report presented data on spectral analysis and acid properties of cyclophosphorous acids with aromatic substituents. In this report, this same method is used to produce 7-membered cyclophosphorous acids with arylene substituents in the dioxaphosphepan cycle, since ordinary hydrolysis of the corresponding chlorides or phosphites cannot produce the acids desired. The synthesis of 2-tert-butyl-4,5,6,7-dibenzo- and 2-tert-butyl-4,5,6,7-dinaphtho-1,3,2-dioxaphosphepans was performed from chlorides and tert-butenol in ether in the presence of pyridine. The phosphite was subjected to thermolysis at 200°C. The isobutylene liberated was collected in a gas holder and identified chromatographically, while the acid formed was distilled in deep vacuum, then crystallized from toluene. A kinetic study of the reaction of the acids with diphenyldiazomethane was performed. It was found that the rate constants and activation parameters for these compounds are similar to the values for 5-membered cyclophosphorous acid. References 4 (Russian0.
[187-6508]

UDC 547.241+547.33

NEW DIRECTION IN REACTIONS OF TRIVALENT PHOSPHORUS ACID ESTERS WITH NITROOLEFINS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 52, No 3, Mar 82 (manuscript received 9 Jun 81) pp 708-709

GAREYEV, R. D., LOGINOVA, G. M. and SHERMERGORN, I. N., Kazan' Veterinary Institute imeni N. E. Bauman

[Abstract] In most reactions of trivalent phosphorus acid esters with conjugate nitroolefins, the process occurs in several directions, leading to the formation of complex reaction mixtures. The direction followed depends on the structure of the reagents and the conditions of their interaction. The reaction of triphenylphosphite with 1-nitro-1-propene was studied. As was expected, triphenylphosphite is less reactive for 1-nitro-1-propene than trialkylphosphites; to complete the process the mixture of triphenylphosphite with 1-nitro-1-propene was held at room temperature for 2 days.

Analysis of the reaction mixture established that 0,0-diphenyl-α-cyanoethylphosphonate, triphenylphosphonate and phenol are formed in equal quantities. The most probable mechanism of the reaction involves several stages. In the first stage a bipolar ion is formed which is cyclized to phosphorane. Essentially this portion of the system is common for all reactions of trivalent phosphorus acid esters with nitroolefins. The subsequent fate of the phosphorane depends on the nature of the substituents at the phosphorus atom. Apparently the presence of three electronegative, easily-departing phenoxyl groups in the compound facilitates rather rapid breaking of the P-O bond with subsequent formation of the end product and phenol from the intermediate. References 1 (Russian).
[187-6508]

UDC 547.546

^{31}P NMR STUDY OF INTERACTION OF o-NAPHTHOQUINONE-DIAZIDES WITH ORGANOPHOSPHORUS NUCLEOPHILIC REAGENTS

Moscow ZHURNAL FIZICHESKOY KHIMII in Russian Vol 56, No 3, Mar 82
(manuscript received 28 Apr 81) pp 610-613

KALIBABCHUK, V. A., ROMANENKO, V. D. and KUTS, V. S., Institute of Physical Chemistry imeni L. V. Pisarzhevskiy, UkSSR Academy of Sciences, Kiev; Ukrainian Polygraphic Institute imeni Iv. Fedorov, Kiev

[Abstract] Title reactions include those of the tri-tert-butylphenyl ethers of 1,2-naphthoquinonediazide-(2)-5-sulfonic acid (A) or of 1,2-naphthoquinonediazide-(2)-5-sulfochloride (B) with triphenylphosphine (I) or tris-(trimethylsiloxymethyl)-phosphine oxide (II). The reaction of I with A or B results in the formation of a stable product: naphthoquinonetriphenylphosphazine in the former and 1,2-naphthoquinone-2-diazide-5-(1,2-naphthoquinone-2-diazide-5-thiol)sulfonate, triphenyldichlorophosphorane, and triphenylphosphine oxide in the latter. In contrast, the reaction of II with A leads to the formation of weak 1:1 complexes. The thermodynamic and spectral characteristics of the complex-forming reactions are determined. Figures 3; references 6: 4 Russian, 2 Western.
[188-12027]

UDC 661:632.951:543.8

CHEMICAL COMPOSITION OF TECHNICAL METAFOS-3

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR: SERIYA KHIMICHESKAYA in Russian No 2, Mar-Apr 82 (manuscript received 17 Jul 80) pp 51-54

KOROL'KOVA, K. I., PIOTROVSKIY, S. V., GORYAYEV, M. I., CHINGISOVA, R. A. and BAKANOV, Sh. A., Kazakhstan Branch of the Institute of Nutrition, Academy of Medical Sciences, Alma-Ata

[Abstract] Technical trichlorometafos-3 (TCM) contains a series of compounds in addition to the principle component 0-methyl-0-ethyl-2,4,5-trichlorophenylthiophosphate. Gas chromatography on an SE-30 column using electron-capture and flame ionization detectors separated six components, five of which were identified on the basis of their respective retention times on other columns of differing polarities. The five compounds and their concentrations are as follows: 2,4,5-trichlorophenol, 9.5%; 0-methyl-hydroxy-0-2,4,5-trichlorophenylthiophosphate, 9.5%; 0-methyl-hydroxy-0-2,4,5-trichlorophenylthiophosphate, 1.0%; 0,0-dimethyl-0-2,4,5-trichlorophenyl-thiophosphate (plus possibly some other impurities), 16.9%; and TCM, 69.1%. As some of these impurities are also metabolites of TCM, this procedure may be used to analyze animal and plant tissue. (TCM is used in southern Kazakhstan to control Wohlfahrtiasis in sheep). Figures 1; references 11 (Russian).
[191-12027]

UDC 632.954:633.34

HERBICIDES ON SOY PLANTATIONS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 26-28

ZHEREBKO, V. M. and VESELOVSKIY, I. V., candidate of biological sciences, Ukrainian Agricultural Academy

[Abstract] At a test farm in the Vasil'kovsk rayon of Kiev oblast, on moderately loamy, low-humus chernozem, "Ramrod", "Zenkor" and "Treflan" herbicides were tested on common soy beans grown in the Ukraine, Zarnitsa,

Terezinskaya 2 and 24 and Belosnezhka. Chiefly annual dicotyledons and grasses were targeted. Treflan was found to thin the soy sprouting of all but Zarnitsa; Zenkor did not affect sprouting much, but with abundant moisture all four strains suffered mortality later in the growing period. Both Ramrod and Treflan eliminated the target weeds throughout the growing season regardless of soil moisture. Zenkor was less effective, and depended on higher moisture. Weather conditions did not contribute to high soy bean yeilds during the test years. Use of Ramrod in optimal and 1.5 optimal doses, and of Treflan at 2.5 kg/hectare made it possible to obtain the same yields obtained on the control plot using cultivation for weed control. All four strains were resistant to Ramrod at 8 and 12 kg/hectare, while only Zarnitsa was unaffected by Treflan.
[212-12131]

UDC 632.954:633.15

GESAPRIM 500 ON CORN PLANTATIONS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 28-29

KARAKASHYAN, K. P., candidate of agriculturel sciences, TEMCHENKO, V. A., candidate of biological sciences, BOKAN', V. S. and ANASHKINA, I. S., Stavropol' Plant Selection Test Station

[Abstract] The authors tested the effectiveness of Gesaprim 500 alone and mixed with 2,4-D (2,4-DA) for weed control, yield and grain quality on a common, lightly leached, alkaline chernozem soil with various monocotyledons and dicotyledons as targets. Dosage and time of application brought weed kill ranging from 52.5 to 81.6% for Gesaprim 500, and in combination with 2,4-DA, from 40-86.1%. The herbicide was less effective when applied during preplanting cultivation than when applied at the 3-5 leaf phase of growth. Optimal effects were obtained with 2 kg of Gesaprim and 1 kg of 2,4-DA per hectare. Amino acid and phosphorus content in the corn grain improved when the herbicides were used.
[212-12131]

UDC 632.954:633.63

HERBICIDE USE ON SUGAR BEET PLANTATIONS IN ALMA-ATA OBLAST

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 30-34

ZHARASOV, Sh. U., candidate of biological sciences, Kazakh Scientific Research Institute for Protection of Plants, Eastern Branch, All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin

[Abstract] Tests were conducted on light-chestnut, slightly loamy soil and gray desert soil in 1972-75 to determine the effectiveness of Fenazon, Hexilur and mixtures of these herbicides with sodium trichloracetate and

Betanal, applied at planting, delachlor applied after planting, and Betanal applied after sprouting. Dicotyledons made up 87% of the weeds in the test plot, with 48% common amaranth and 35% pigweed. Moisture was abundant in all years except 1975, when only about 70% of the usual amounts fell. Results showed that mixtures of Hexilur and Betanal were increasingly effective in controlling weeds in proportion to dosage, with 33-60% reduction in infestation achieved along with increased yields of sugar beets. Hexilur alone at 2.1 kg/hectare reduced yields. High doses of delachlor with sodium trichloracetate was 90.9-94.0% effective in controlling weeds. With these compounds yields were increased, but sugar content fell. Excess doses of Hexilur and Fenazon reduced actinomycetes and fungi as well as dicotyledons. The tested compounds somewhat increased nitrification, and had no toxic effects regardless of weather conditions. Nor did they affect protease activity in the serozem soils. Specific mixture recommendations for various compounds tested are given.
[212-12131]

UDC 632.951:541.14

PHOTOLYSIS OF METAPHOS, METATHION AND CYANOX

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 4, Apr 82 pp 39-40

NESTEROVA, I. P., candidate of chemical sciences, and PATRASHKU, F. I., candidate of agricultural sciences, All-Union Scientific Research Institute of Biological Means of Plant Protection

[Abstract] The effects of light on decomposition of the title compounds, and of sun and ultraviolet rays on the active ingredients of cyanox were measured by subjecting 20% metaphos and 50% metathion and cyanox solutions to sunlight. Analysis by gas-fluid chromatography showed that the title compounds decomposed by 1/2 in 6, 7 and 16 hours, respectively. Under ultraviolet radiation with a 365.6 nm long wave, pure cyanox broke down much quicker, leaving only 9.8% after 1.5 hours with radiation in an aqueous solution and 15.8% in a film. Sunlight had a lesser effect on cyanox. An oxygen analog of cyanox was found when the pure compound was irradiated with ultraviolet light and when the prepared form was subjected to sunlight, but not when the pure substance was subjected to sunlight. The analog was found to be more persistent than the original compound. References 4: 1 Russian, 3 English.
[212-12131]

UDC 547.665.2

ALKYLATION OF PHENOL BY POLYBUTENES IN PRESENCE OF BENZENESULFONIC ACID

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 82 pp 11-12

BELOV, P. S., GULYAYEV, I. A., KORENEV, K. D., ZAKUPRA, V. A. and YAKOVLEV, V. B., Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin

[Abstract] Benzenesulfonic acid, used in production of commercial tert-alkyl(C_5-C_{12})alkylphenol, was tested as a catalyst for alkylation of phenol by polybutenes. The yield of high-molecular alkylphenols when phenol interacts with polybutenes in the presence of benzenesulfonic acid was approximately the same as in the presence of boron fluoride. The optimum combination between acceleration of the reaction and its limiting increase of alkylate viscosity is achieved at approximately 105°C and at molar ratio of benzenesulfonic acid to polyisobutylene of 0.15. A method of analyzing the products of alkylation using liquid microchromatography on silica gel and gas-liquid chromatography was developed. Benzenesulfonic acid is recommended as an effective substitute for boron fluoride, complexes of boron fluoride and other corrosion-aggressive catalysts for alkylation of phenol by polybutylenes. Figures 2; references 6: 4 Russian, 2 Western.
[150-6521]

UDC 665.662.2

PRODUCTION OF PARAFFIN SOLVENTS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 82 pp 12-14

ALEKSEYEVA, R. V., KUVAYEVA, M. M. and SOVOZU, M. Sh., Krasnodar Branch, "Lenneftekhim" Scientific Production Association

[Abstract] Two versions are considered for production of high-quality hexane and heptane solvents from a reforming raffinate with purification on A-4M natural adsorbent. Separate purification of the hexane and heptane fractions separated from the raffinate by rectification was more feasible than purification of the initial reforming raffinate with subsequent separation

of the solvents. The process flow diagram is presented for producing paraffin solvents by rectification of the reforming raffinate with subsequent purification of separated hexane and heptane fractions. Purification of the catalytic reforming raffinates on A-4M adsorbent guarantees the removal of unsaturated hydrocarbons and production of hexane and heptane solvents of the required quality. Figures 1; references 2 (Russian).
[150-6521]

UDC 665.765-403.038.5

MECHANISM OF SYNERGISTIC ACTION OF PAIRED ANTIOXIDANTS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 2, Feb 82 pp 31-32

KOZLOVA, Ye. K., KOTOVA, G. G., FUKS, G. I. and EMINOV, Ye. A., All-Union Scientific Research Institute of the Petroleum Industry

[Abstract] The synergistic action of ionol-betol and ionol-quinizarin paired antioxidants was studied to determine the oxidation stability of turbine and transformer oils and in lubrication oils. The antioxidation stability of oils is increased by a factor of 2-2.5 when these antioxidants are present compared to oils containing only one additive. The paired antioxidants have an advantage over ionol alone in the presence of copper catalysts. Quinizarin and especially betol as a second additive significantly inhibits the dissolution of copper in oils, indicating a passivating effect of the additives. The synergism of the action of the selected "paired antioxidants" is explained by the passivating and deactivating effect of one of them in blocking the radical process of oxidation by ionol, the basic antioxidant. Figures 3; references 5: 4 Russian, 1 Western.
[150-6521]

UDC 665.765-404.038.5

ESTIMATE OF EFFECTIVENESS OF DIALKYLDITHIOPHOSPHATE TYPE HYDROCARBON ANTIOXIDANTS

Kiev NEFTEPERERABOTKA I NEFTEKHIMIYA in Russian No 20, 1981
(manuscript received 18 Jul 79) pp 52-54

KONOVICH, L. G., LEBEDEVA, R. D., POZHIDAYEVA, V. N. and TARASOVA, N. S., All-Union Scientific Research Institute of Production and Design for Petrochemistry

[Abstract] In order to select a reliable laboratory method for evaluating the antioxidant effectiveness of dialkyldithiophosphate type additives, several laboratory methods were tested: determination of thermal oxidative stability in evaporators; determination of varnish formation properties;

determination of stability based on induction period of sediment formation. The antioxidant properties of the additives are manifested in determination of the thermal oxidative stability by the method of Papok, varnish forming properties and by method IKM-20. The DK-NAMI instrument is determined to be not reliable in estimating the effectiveness of dialkyldithiophosphate additives. References 4 (Russian).
[205-6508]

UDC 665.765-404.038.2

AMIDIOTHIOPHOSPHATES - ANTIFRICTION AND ANTIWEAR ADDITIVES FOR LUBRICATING OILS

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 23-24

VIPPER, A. B., BELOV, P. S., LASHKHI, V. L., PARFENOVA, V. A., BLOKHINA, I. V. and KULAGIN, V. V., Moscow Institute of Petrochemical and Gas Industry imeni I. M. Gubkin

[Abstract] Amidothiophosphates, the products of interaction of dialkyl- and dialkylarylthiophosphoryl chloride with diethylenetriamine, were studied as antifriction substances which do not increase the ash content of lubricating oils and fuels. The antifriction and antiwear properties were studied under moderate friction conditions such as those encountered by motor oils. The additives were present at 0.5 to 3%. The results indicate that under the friction conditions tested (0.7 m/s, specific load 126 MPa, oil temperature 93°C) the amidothiophosphates were more effective than zinc dithiophosphates. 1-2% Di(octylphenyl)thiophosphoryl chloride with diethylenetriamine significantly improved the antifriction properties of an oil already containing 1% of an oil-soluble molybdenum compound. References 5: 4 Russian, 1 Western.
[200-6508]

UDC 389.0:662.75:658.562

TESTING REPRODUCIBILITY OF TEST RESULTS, A BASIC ELEMENT IN METROLOGIC SUPPORT OF POL MATERIAL QUALITY

Moscow KHIMIYA I TEKHNOLOGIYA TOPLIV I MASEL in Russian No 4, Apr 82 pp 34-35

KLOPOV, B. N., SILIN, A. V., ZHAVORONKIN, Yu. A. and MAKAROVA, N. K.

[Abstract] Primary areas in which metrologic support of POL quality needs to be improved include certification of methods of measurements, metrologic improvement of standards for test methods, certification of laboratories, application of standard specimens and introduction of statistical testing. A study is made of the experience gained in checking the reproducibility of test results as the final stage in metrologic support systems, evaluating

the effectiveness of all elements of the system from the standpoint of assurance of comparability and unambiguity of test results. A comparison of the accuracy of results of POL material testing in various laboratories shows that in those laboratories where reproducibility checks are regularly performed the error in test results averages 44% less than in those where such checks are not performed. References 2: 1 Russian, 1 Western. [200-6508]

UDC 613. 32:631.8:577.164.18

LABOR HYGIENE IN POTASSIUM FERTILIZER PRODUCTION

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 2, Feb 82 (manuscript received 8 Oct 81) pp 39-40

ARKHANGEL'SKIY, V. A. and KHODYKINA, T. M., First Medical Institute imeni I. M. Sechenov, Moscow

[Abstract] A study was made of problems of labor hygiene and occupational morbidity of workers involved in processing chlorine-free potassium fertilizers (potassium sulfate, potassium-magnesium-sulfate fertilizer, kalimagneziya). The studies were performed at a fertilizer plant processing polymineral potassium-langbeinite ore by chemical methods. Acute respiratory infections were found to have the greatest frequency and duration of all lost-time illnesses. Health improvement measures should be directed primarily toward dust control.
[213-6508]

UDC 613.132+614.72]:615.285.7

WAITING TIME AFTER APPLICATION OF CARBAMATES AND THIOCARBAMATES TO IRRIGATED FIELDS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 2, Feb 82 (manuscript received 27 Aug 81) pp 40-42

POPOVICH, N. A., Institute for Advanced Training of Physicians, Kiev

[Abstract] A study was performed of the migration of thiocarbamate derivative herbicides in the air following application to irrigated fields, in response to complaints of rice farm workers of bad odors in the air in rice plantations treated with the herbicide yallane. Thirty four workers filled out questionnaires indicating that on the fourth day after application of the herbicide but before irrigation of the soil they did not smell the preparation in the air. Irrigation on the fifth day caused a strong odor to return, reported by 89% of the workers, while 11% reported a weak odor. The herbicide content

in the air was also studied. The results of the study indicate that when the field is irrigated within 5 days after application of the herbicide, an additional 3 days should be allowed to pass before workers return to the field, 5 days when tillam is used. If 6 to 9 days pass between application and irrigation, the additional waiting period needs to be 1 to 3 days. If more than 10 days pass between application and irrigation, no additional waiting is required. References 8 (Russian).
[213-6508]

UDC 615.9:547.221:614.842.614].015.4:[616.15+616-008.9

TOXICOMETRY OF HALON 1301 AND ITS INFLUENCE ON CORRELATION BETWEEN HEMATOLOGIC AND BIOCHEMICAL INDICES IN ANIMALS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 2, Feb 82 (manuscript received 2 Dec 80) pp 52-53

VORONIN, V. A., DENISENKO, A. A., LINYUCHEVA, L. A., PETUSHKOV, N. M., MEN'SHIKOVA, Z. I., NECHIPORENKO, S. P., AKHMATOVA, M. A., IVANOVA, V. A., LAZAR', G. Yu. and KULAKOV, V. Ye.

[Abstract] Halon 1301 manufactured according to technical specifications TU 6-02-2-354-74 was studied. The inhalation effect was studied in acute experiments on white mice and male rats exposed for 2 hours (mice) and 4 hours (rats) in air with normal oxygen content. Low toxicity was confirmed in that relatively high concentrations are required to cause death. The primary pathogenic mechanism of intoxication is hypoxia: depression of tissue respiration and the respiratory function of the blood. [Halon 1301, which is trifluorobromomethane, is termed Khalon 13B in the Soviet text.] References 14: 10 Russian, 4 Western.
[213-6508]

UDC 613.632.4:547.214]:613.155.3

DETERMINING MAXIMUM PERMISSIBLE CONCENTRATION OF TETRACHLOROBUTADIENE IN WORK PLACE AIR

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 2, Feb 82 (manuscript received 27 Jul 81) pp 53-54

GIZHLARYAN, M. S., KAZARYAN, A. S., KANAYAN, A. S. and BAL'YAN, V. V., "Nairit" Scientific-Production Association, Yerevan

[Abstract] The toxicity of tetrachlorobutadiene (TCBD) was studied in acute, subacute and chronic experiments involving inhalation of vapors, administration intragastrically, application to undamaged skin and ophthalmic

mucosa. The cumulative properties of TCBD were also studied. The clinical picture of acute poisoning of animals by all methods of administration was similar, characteristic of narcotic action. The LC_{50} for rats was 1600 mg/m^3, for mice 670 mg/m^3; the LD_{50} was 421 and 486 mg/kg. Application of TCBD to rabbit ophthalmic mucosa caused severe hyperemia and abundant lacrimation with purulent conjuctivitis continuing for 13 to 15 days. TCBD causes damage to the parenchymatous organs and central nervous system. It has no specific embryotoxic or gonadotoxic properties. It has clear cumulative properties. The MPC in the air of the work place is set as 0.5 mg/m^3. References 7: 6 Russian, 1 Western.
[213-6508]

UDC 613.6:061.3(470-24)"1981"

SOME RESULTS OF 35TH MOSCOW CITY SCIENTIFIC CONFERENCE ON BASIC PROBLEMS OF LABOR HYGIENE (MOSCOW, MARCH 1981)

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 2, Feb 82 pp 56-57

ARKHIPOV, A. S., Moscow

[Abstract] The title conference was held 19-20 Mar 81 and attracted over 250 participants, who heard 38 reports. Subjects discussed included: primary results and tasks of labor hygiene in relation to technical progress in industry; labor hygiene in the light of the resolutions of the 26th CPSU Congress; effects of tuberculosis, malnutrition, air pollution and poor living conditions on the course of pneumoconiosis; individual sensitivity to industrial poisons; prophylaxis of hypertension and ischemic heart disease, acute respiratory disease, pneumonia, ulcers, etc.; use of an automatic control system for analysis of occupational morbidity; sanitary-hy ienic evaluation of new sources of high intensity light; contamination of the skin of workers with lead in the production of ceramic paints and enamels; and study of the bacterial content of the air in textile plants.
[213-6508]

UDC 577.1:615.2/3

INTERMOLECULAR REACTION OF CERTAIN PHOSPHORUS-CONTAINING ETHYLENEIMINE DERIVATIVES WITH FATTY ACIDS AND PHOSPHOLIPIDS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 29 Apr 81) pp 406-409

PANASENKO, N. A., YARTSEV, V. G., KOCHERGINSKIY, N. M., BOLDESKUL, I. Ye., PROTSENKO, L. D. and MOSHKOVSKIY, Yu. Sh., Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow Oblast; Kiev Scientific Research Institute of Pharmacology and Toxicology, Ukrainian Ministry of Health

[Abstract] To determine possible membrane altering properties of N-benzoyl-N',N''-diethylene triamide of phosphoric acid, known in oncologic practice as benzotef, and N-phenyl-N',N''-diethylene triamidophosphoric acid, which has antiblastic activity and is known as A-4, the authors used IR spectroscopy to study the intermolecular interactions of these compounds with certain fatty acids and phospholipids. The IR spectra of the substances studied in the individual state and in solutions with carbon tetrachloride were recorded in the 400-4000 cm^{-1} range. Of particular interest was a comparison of the properties of A-4 and benzotef, which has an additional carbonyl group. Judging from the spectra produced, this preparation is capable of forming hydrogen bonds with fatty acids. The formation of various types of associates between antitumor preparations and membrane components will apparently influence their pharmacologic and pharmacokinetic properties. Interactions of this type must also be considered in creating new drugs, for example when including biologically-active substances in liposomes.
Figures 4; references 11: 10 Russian, 1 Western.
[207-6508]

UDC 615.272.2.014.425.012.1

β-HYDROXY DERIVATIVES OF SIX-MEMBERED NITROGENOUS HETEROCYCLES: SYNTHESIS, INHIBITING ACTIVITY AND BIOLOGICAL PROPERTIES (REVIEW)

Moscow KHIMIKO-FARMATSEVTICHEKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 8 Oct 81) pp 412-428

SMIRNOV, L. D. and DYUMAYEV, K. M., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] The purpose of this review is to systematize available date on the syntheiis, and to study the inhibiting and biological properties of β-hydroxy derivatives of six-membered nitrogenous heterocycles. The review does not include data on hydroxyaromatic compounds containing a condensed nitrogen-containing heterocycle as a substituent (derivatives of 6- and 8-hydroxyquinoline, 5- and 6-hydroxyquinazoline, etc.). The

methods of synthesis of the β-hydroxyderivatives of nitrogenous heterocycles are described in detail. It is found that alkyl substituted 3-hydroxypyridine derivatives and other β-hydroxyderivatives indicates that they are effective free radical reaction inhibitors. β-hydroxyderivatives of nitrogenous heterocycles can be used for protection from the destructive effects of free radicals of biological macromolecules and also for the regulation of a number of processes involving them. In addition to the radioprotective effect, the influence of the derivatives on the central nervous system has been studied in some detail. 3-hydroxypyridine derivatives containing aminomethyl groups, plus 3-hydroxyquinoline and 4-hydroxyisoquinoline have the strongest central nervous system effect. Some coorelation was found between the pharmacologic activity of these compounds and their antiradical activity. One of the most important properties of radical process inhibitors is their capability to increase the resistance of the blood to mechanical trauma, hypotension and acid hemolysis. 3-hydroxypyridine derivatives can restore hematopoiesis after irradiation. It is established that sterically-hindered phenols and 3-hydroxypyridine derivatives have a clear protective effect against toxic effects of diethylnitrosamine, a strong hepatotropic carcinogen, in rats. The assumption that one of the essential and characteristic factors in aging is the development and intensification of free radical oxidizing reactions has served as a basis for the search for chemical geroprotectors among aromatic and heterocyclic series antioxidants. Slowing of aging of experimental animals upon addition of ionol and santoquin has been established. Radical process inhibitors can have a directed influence on the biological membranes of lymphoid cells and the immunobiological properties of lymphocytes. 2-ethyl-6-methyl-3-hydroxypyridine derivatives are recommended for use in combination with other preparations for their antitumor effects. 3-hydroxypyridine derivatives also have a bacteriostatic effect, completely suppressing the reproduction of cells for rather long but finite periods of time. The strongest bacteriostatic effect is that of 4-dimethylaminomethyl-2,6-dimethyl-3-hydroxypyridine. References 123: 105 Russian, 18 Western.
[207-6508]

UDC 615.273.53:678.744.65].012.1

DIRECT ACTING SYNTHETIC POLYMER BLOOD ANTICOAGULANT

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 29 Dec 80) pp 438-441

ANNENKOVA, V. Z., UGRYUMOVA, G. S., PLATONOVA, A. T. (deceased), ANNENKOVA, V. M., KAZIMIROVSKAYA, V. B., ROMAN'KOVA, N. P. and VORONKOV, M.G., Irkutsk Institute of Organic Chemistry, Siberian Division, USSR Academy of Sciences

[Abstract] Results are presented from a study of the anticoagulant activity of -hydroxysulfonal acid derivatives of copolymers of acrolein and acrylic acid (copolymer IV). Studies of the system of hemostasis are performed by

methods generally accepted in practice, with anticoagulant activity determined in heparin units. Intravenous administration of the preparation to rabbits at 4 mg/kg causes hypocoagulation almost immediately after injection, with the effect lasting from 8 to 24 hours depending on dose. The most active anticoagulant studied is a copolymer produced with the ratio of acrolein to acrylic acid 60:40 mol.%, which the authors call acrylsulfacrine. Figures 2; references 6: 4 Russian, 2 Western.
[207-6508]

UDC 612.791:615.2/.3+615.2/.3.032.77

ESTIMATE OF SKIN PERMEABILITY OF DRUGS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 26 Aug 81) pp 441-444

FRUMIN, G. T. and GORBACHEVA, T. S., Military-Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] An attempt was made to develop a simple, qualitatively homogeneous and reliable quantitative approach to estimation of skin permeability for a variety of drugs. The mathematical model developed relates a constant of permeability of the substance through the inert membrane of the skin to the physical and physical-chemical characteristics of the penetrant, easily calculated from the structural formula of the compound. Comparison of calculated penetration capacities with literature data showed that for most groups (75%) the correlation coefficient of the model varied between 0.92 and 0.98; it was slightly below 0.90 for the remaining 25% of substances studied. The mathematical model thus allows correct description and explanation of the variation in skin penetration rates for penetrants of various chemical natures using just two parameters - molecular mass and distribution factor. Increasing distribution factor causes an increase in rate of penetration, increasing mass causes a decrease in rate of penetration, which has a clear physical sense. References 17: 7 Russian, 10 Western.
[207-6508]

UDC 615.478.6/.7.014.453:579.8.04:621.3.084.89

DYNAMICS OF RADIATION RESISTANCE OF MICROORGANISMS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 16, No 4, Apr 82 (manuscript received 19 May 81) pp 481-483

PAVLOV, Ye. P., TUSHOV, E. G. and SEDOV, V. V.

[Abstract] Results are presented from studies conducted in 1975-1979 on the dynamics of the level of radiation resistance of radioresistant microorganisms obtained in the production of radiopharmaceutical preparations using ionizing

radiation to sterilize preparations and at medical preparation plants where ionizing radiation was not used. Twice a year, smears from products and tampons were filtered, the membrane filters were dried, irradiated at 5 kgr or 10 kgr and placed on a dense nutrient medium, incubated for at least 10 days at 32°C, after which the colonies were transplanted and the dose required to divide the population of microbes by 10 was determined. The results indicate high stability of production microflora - they confirm the high reliability of the sterilizing dose at 25 kgr used in industry, even with the maximum permissible microcontamination of products. Referencss 5: 4 Russian, 1 Western.
[207-6508

UDC 541.64:547.9

POLYMER DERIVATIVES OF ADAMANTANE

Moscow USPEKHI KHIMII in Russian Vol 51, No 3, Mar 82 pp 480-506

KHARDIN, A. P. and RADCHENKO, S. S., Volgograd Polytechnical Institute

[Abstract] This article presents a review of the literature on polymeric adamantane derivatives. Carbon chain polymers, polyesters, polysulfones and polycarbonates, polyamides, polyurethanes, epoxy resins, cyclic chain polymers and biologically-active adamantane-containing polymers are discussed. The relationship between steric structure and reactivity is studied. Adamantane chemistry is largely driven by the biological activity of some of its functional derivatives. Adamantane polymers have been suggested as potential antiviral agents, and the polymer products have been found to be less toxic than adamantane amino derivative chlorohydrates, while having five times longer prophylactic effect. The introduction of the polyhedric adamantane molecule to polymers significantly improves some of their properties, increasing thermal stability, resistance to oxidation and hydrolysis, to light and solvents. References 114: 47 Russian, 67 Western.
[196-6508]

UDC 541.6.004.12

INFLUENCE OF OLIGOXYETHYLENE ADDITIVES ON RHEOLOGIC PROPERTIES OF POLYOXYETHYLENE

Kiev UKRAINSKIY KHIMICHESKIY ZHURNAL in Russian Vol 48, No 3, Mar 82 (manuscript received 15 May 80) pp 319-321

KOSTINOVA, T. A. and USKOV, I. A., Kiev State University imeni T. G. Shevchenko

[Abstract] The fluidity of polyoxyethylene (POE) can be increased by the plasticizing effect of low molecular additives, which may also influence structure formation and the properties of the fibers formed, flocculation capacity and hydrodynamic activity of the end product. Low molecular weight and oligomer compounds of the homologous ethylene oxide series meet these

demands most completely. The plasticizing effect of diethylene glycol and oligooxyethylenes with molecular masses of 600, 1500 and 3000 were studied. Additives and doses were established which yield satisfactory POE-based fibers. The concentration of OOE in the melt should not be over 30%. Oligomers with M≤1500 are promising. Figures 4; references 6: 5 Russian, 1 Western.
[197-6508]

UDC 678.742.2:66.095.264

HIGH TEMPERATURE POLYMERIZATION OF ETHYLENE ON TITANIUM-MAGNESIUM CATALYSTS

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 82 (manuscript received 15 Dec 80) pp 18-19

BAULIN, A. A. and KOPYLOV, V. M.

[Abstract] A study was made of the effectiveness of titanium-magnesium catalysts (TMC) for high temperature polymerization of ethylene. The TMC used were a solid catalyst and a system of components soluble in a hydrocarbon solvent. The TMC were 2 to 20 times more active than ordinary catalysts at 160°C, and 20 to 80 times more active at 200°C. The catalysts are thus highly effective in the process of high temperature polymerization of ethylene in a hydrocarbon solvent. Figures 2; references 5: 4 Russian, 1 Western.
[202-6508]

UDC 678.743.22.02

STATUS AND PROSPECTS FOR DEVELOPMENT OF POLYVINYL CHLORIDE PRODUCTION

Moscow PLASTICHESKIYE MASSY in Russian No 4, Apr 82 pp 20-21

POPOV, V. A.

[Abstract] Current world production of PVC approximates 10 million tons per year, with a production capacity of 14 to 15 million tons. Polymerization in a suspension is the most common method of production of this polymer. A very important component of the polymerization mass in this method is the emulsion stabilizer. Highly-active initiating systems have been introduced, capable of reducing the polymerization time to 6-8 hours and intensifying polymerization rates. Fourteen to 29 cubic meter reactors are presently in use in the USSR, though 40 and 80 cubic meter reactors equipped with reflux condensors have been tested. A new PVC facility is now equipped with a 200 cubic meter reactor, though economic analysis shows the optimal size to be 80-110 m^3. New high capacity PVC production facilities will utilize the block method, which is 6.9% less expensive and produces less waste water than the suspension method, though the polymerization reactor is somewhat more complex. VC copolymers and modifying additives for PVC are briefly discussed.
[202-6508]

UDC 665.65:678.049

ASPHALTENE-RESINOUS RUBBER MIXTURE SOFTENERS

Kiev NEFTEPERERABOTKA I NEFTEKHIMIYA in Russian No 20, 1981
(manuscript received 16 Mar 80) pp 45-49

BODAN, A. N., KOSTYUK, B. L., LITVINOVA, T. V. and DOLUKHANOV, R. Ts.,
All-Union Scientific Research Institute of Production and Design for Petrochemistry

[Abstract] Raw materials used for production of asphaltene-resinous substances are reviewed. The production technology of these substances in CEMA and western countries is contrasted. It is noted that whereas in the CEMA member countries oil refineries produce all asphaltene-resinous ingredients, in many capitalist countries they are produced at specialized plants producing various rubber mixture ingredients or at chemical plants. Examples are cited. Analysis of the status of application of asphaltene-resinous substances as rubber mixture ingredients shows that a broad assortment of such ingredients is produced in the capitalist countries, and are used to regulate not only the technological properties of rubber mixtures, but also the physical and mechanical characteristics of vulcanizates.
References 23: 9 Russian, 1 Eastern European, 13 Western.
[205-6508]

UDC 621.039:53.082.8

APPLICATION OF CHEMILUMINESCENT METHOD OF ANALYSIS TO CONTROL PARAMETERS OF REACTOR WATER OF NUCLEAR POWER PLANTS

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 18 Jul 80) pp 45-47

SARYLOV, V. N., DUBOVENKO, L. I., GUTA, A. M., KOMASHCHENKO, V. N. and PETROV, V. N., "Energiya", Scientific Production Association, Moscow

[Abstract] Chemiluminescent analysis in known to be a satisfactory procedure for automatic assay of micro-quantities of hydrogen peroxide in aqueous solutions in non-radiactive regimes. The present work involved experimental study of the effect of radioactive radiation on the chemiluminescence of lucigenin, used in chemiluminescent analysis, to determine the reliability of using the chemiluminescent method to analyze radioactive reactor waters. Radioactive radiation with greater intensity than that occurring at nuclear power plants has no effect on the electroluminescent system of the indicator used. Thin-film semiconductor photoelectric transducers permit reliable measurement of the chemiluminescence parameters in the presence of radioactive radiation. Figures 2; references 11: 10 Russian, 1 Western. [157-6521]

UDC 541.183.5+628.31

USING POLYSORBENT C FOR WASTE WATER PURIFICATION FROM p-CHLOROBENZENE SULPHAMIDE AND CALCULATION OF BASIC PARAMETERS FOR LOCAL ADSORPTION INSTALLATION

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 1 Sep 81) pp 50-53

POLYAKOVA, V. V. and LEVCHENKO, T. M., Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The removal of p-chlorobenzene sulphamide--which is a valuable raw material in medicinal manufacture--from waste waters of monochloramine production with polysorbent C and KAD (activated charcoal) was investigated

and the basic parameters of the local adsorption installation were calculated. The use of polysorbent C made it possible to retrieve and utilize the p-chlorobenzene sulphamide from the waste waters. Ethanol can be used to regenerate the initial capacity of the polysorbent C. Acetone, 10% and 5% solutions of NaOH and superheated steam provided lower rates of regeneration of polysorbent C saturated with p-chlorobenzene sulphamide. Figures 2; references 12: 10 Russian, 2 Western.
[157-6521]

UDC 622.765:628.162

FLOTATION SEPARATION OF DDT FROM WATER

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 15 Dec 80) pp 53-55

SKRYLEV, L. D., NEVINSKIY, A. G., PURICH, A. N. and LOPATENKO, S. V., Odessa State University imeni I. I. Mechnikov

[Abstract] The basic physical and chemical principles of flotation purification of water contaminated with DDT were investigated, using fatty acids and their potassium soaps as the absorbing agents. Fatty acids containing from 10 to 18 carbon atoms in their molecule are effective absorbents of suspended particles of DDT. The effectiveness of their action increases as the length of the hydrocarbon radical increases. A pH of 2-4 is optimum for the most complete flotation removal of DDT. An increase of the absorbing agent flow rate from $5 \cdot 10^{-3}$ to $2 \cdot 10^{-1}$ mmole/liter contributes to flotation separation of DDT. No more than 10 minutes are required for flotation purification of water contaminated with DDT. An increase to 50°C of water temperature used in flotation separation (or decrease to 10°C) has no significant effect on the effectiveness of flotation separation of the pesticide. Figures 4; references 9: 8 Russian, 1 Western.
[157-6521]

UDC 628.335

PURIFICATION OF GREENHOUSE WASTE WATERS OF PESTICIDES

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 23 Apr 81) pp 56-58

GRECHKO, A. V., MARCHENKO, P. V. and SHEVCHENKO, M. A., Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Processes of pesticide neutralization in greenhouse waste waters by hydrolysis, ultraviolet radiation and electrocoagulation were investigated to develop a combination process flow diagram for purification of this type

of waste water. A laboratory installation is described for removal of various types of pesticides such as chloroorganic and organophosphorous compounds, carbamates, dinitrophenols and inorganic substances from waste waters. The pesticide content in waste waters can be reduced by 67-99% by using a combination of the methods. Figures 1; references 8 (Russian).
[157-6521]

UDC 576.8.095.3:628.35

PILOT-PLANT TRIALS OF MICROBIOLOGICAL METHOD OF WASTE WATER PURIFICATION OF HEXAMETHYLENE DIAMINE

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 22 Jun 81) pp 68-70

GVOZDYAK, P. I., ROY, A. A., DATSENKO, I. N., DENIS, A. D., LYASKOVSKIY, A.S., NIKONENKO, V. U. and VERENYA, N. P., Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] A process flow diagram was developed for microbiological purification of industrial waste water of hexamethylene diamine. The Chernigov "Khimvolokno" Production Association designed and developed a semiindustrial installation for purification of waste water from the chemical shop of the Anid plant. The effectiveness, simplicity and reliability of the microbiological method of waste water purification was demonstrated by semiindustrial tests. Figures 1; references 7: 6 Russian, 1 Western.
[157-6521]

UDC 576.8.095.1

INTENSIFYING METHODS TO PURIFY WATER OF VIRUSES

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 4, No 1, Jan-Feb 82 (manuscript received 26 Mar 81) pp 82-86

KUL'SKIY, L. A., VOROB'YEVA, A. M. and MATSKEVICH, Ye. S., Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The capabilities of current and developing methods of virus inactivation were considered and compared with respect to the main source of entry of enteroviruses into the environment through sewage and domestic waste water. Removal of the viruses from open reservoirs used in the water supply system of populated points was studied. Coxsackie viruses subjected to electric current in the presence of lanthanum chloride are more sensitive

to sodium hypochlorite and die within a very short time after being subjected to that agent. The use of physical methods in combination with chemical substances with oxidizing capability is a method that can be used to purify waste water of intestinal viruses. References 17: 10 Russian, 7 Western. [157-6521]

UDC 628.543.12:665.767:621.9:815.9

CHEMICAL COMPOSITION AND METHODS OF DECONTAMINATION OF WASTE WATERS FROM PRODUCTION OF CERTAIN ADDITIVES

Kiev NEFTEPERERABOTKA I NEFTEKHIMIYA in Russian No 20, 1981
(manuscript received 13 Nov 79) pp 57-61

GRUNIN, G. N., GORDASH, Yu. T., VASILENKO, G. D. and LITOVCHENKO, N. R., All-Union Scientific Research Institute of Production and Design for Petrochemistry

[Abstract] One characteristic feature of the waste water generated by facilities producing additives is that their composition is complex with a high concentration of organic and mineral contaminants. Biochemical pro esses used in purification are inhibited by increasing concentrations of contaminants, requiring dilutions of as high as 1:300 before biological purification installations can be effective. Work was performed at the authors' institute to determine the best method of purification of highly mineralized and toxic waste waters. A radical method of decontamination of waste water is by heat, which can completely evaporate the waste water and eliminate the contaminants they contain by completely oxidizing the organic matter producing gaseous combustion products and solid matter. The studies performed showed that the most effective oxidant to be used for decontamination of high-sulfur waste water is chlorine, which generates a 15-20% NaCl solution and a sediment containing 90 to 95% sulfur which can be used in other branches of industry. Polycondensation is effective for purification of waste water from production of alkylsalicylate additives. Waste water from sulfonate production is decontaminated by blowing through air to remove ammonia, distillation of isopropyl alcohol and oxidation with chlorine with subsequent dechlorination. The ammonia water and isopropyl alcohol produced can be returned to the technological process. Figures 2; references 2 (Russian).
[205-6508]

UDC 665.767:621.56

COMPOSITION AND PROPERTIES OF SODIUM ALKYLSULFAMIDOACETATE

Kiev NEFTEPERERABOTKA I NEFTEKHIMIYA in Russian No 20, 1982
(manuscript received 26 Feb 79) pp 77-82

VOLOSHCHUK, L. L., GUSHANSKAYA, P. G., LEV, L. I., SAVANOVA, M. A., SOLTAN, S. G. and SYCHEVA, L. F., LONMZ imeni Shaumyan

[Abstract] The possibility is studied of synthesizing compounds of the type $R\text{-}SO_2\text{-}NH\text{-}CH_2\text{-}COONa$ based on raw materials produced on an industrial scale; the applicability of such products as emulsifiers for cutting fluids is evaluated. Technical $C_{12}\text{-}C_{18}$ hydrocarbon paraffin sulfochlorides, intermediate products in the production of synthetic detergents, were widely used. The products of condensation of alkylsulfamide and the sodium salt of monochloroacetic acid were tested as emulsifiers. It was found that products containing not over 7% unreacted alkylsulfamide are active emulsifiers and have antirust properties. The emulsifiers produced are highly stable upon storage. Their properties were retained in storage for periods of over 3 years. Figures 4; references 16 (Russian).
[205-6508]

UDC 001.89

EVALUATION BY CITATION ANALYSIS IN SCIENCE

Moscow STNIK AKADEMII NAUK SSSR in Russian No 4, Apr 82 pp 61-65

MARKUSOVA, V. A. and KHADIAROV, G. G., candidates of technical sciences

[Abstract] Citation analysis is widely used as a research method both in the USSR and abroad, to determine the leading scientific journals in a specific subject area, to study the flow of the scientific literature, particularly for quantitative estimates of dissipation and aging of information, for analysis of the technology of scientific research and the process of propagation of new ideas. Such powerful tools as the Science Citation Index can be used to refine our concepts concerning the system of scientific communication on the world wide scale. The importance of a deeper analysis than simple counting of citations in order to determine the contributions of individual scientists and perform other analytic tasks is emphasized. Retrospective literature citation indices on petroleum and economics have been published in the Soviet Union since 1973. In 1974 a retrospective index on information science was produced as well. The initial data base used consisted of references contained in articles published in 1964-1973 in the collection "Scientific-Technical Information." The file consisted of 9,535 bibliographic references, both Soviet and foreign. The authors call for a discussion of the subject of publication of a current Soviet index of literature cited on natural and technical sciences.
[199-6508]

CSO: 1841

- END -